U. S. Government

RESEARCH REPORTS

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. . . A monthly listing of Government research reports available to industry . . .

Engineering

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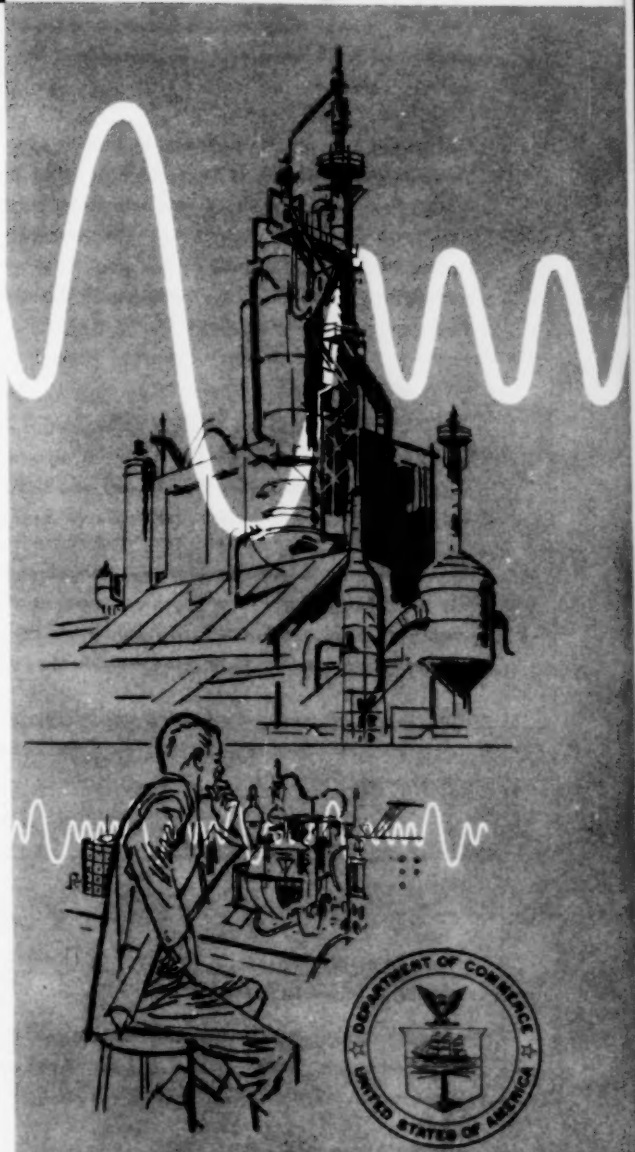

U. S. DEPARTMENT OF COMMERCE
Office of Technical Services

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U. S. GOVERNMENT RESEARCH REPORTS

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U. S. DEPARTMENT OF COMMERCE
Sinclair Weeks, *Secretary*

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U. S. Government RESEARCH REPORTS

Vol. 22, No. 6 December 17, 1954

CARTOGRAPHY

On the precision obtainable for gravimetric determinations of the geoid, by Reino A. Hirvonen. Ohio State University Research Foundation. Mapping and Charting Research Laboratory. Mar 1953. 22p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115550

Technical paper no. 171. Contract AF 19(604)-287. Project 504.
1. Gravimetric analysis 2. Gravitation - Determination 3. Gravity - Theory 4. OSURF TP 171.

CHEMICALS AND ALLIED PRODUCTS

Plastics and Plasticizers

Apparatus and methods for determining some dynamic properties of non-rigid plastic materials, by Russell B. Kirby, Jr. Princeton University. Plastics Laboratory. Aug 1954. 46p drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115400

This paper presents a method for determining the dynamic (complex) modulus, creep, creep recovery, and flow of viscoelastic materials over a limited rate spectrum and a large temperature range. The apparatus and theory of the method are presented, and some typical results obtained with specimens of calendered polyvinyl chloride are included. Contract no. DA-36-039SC-42633, Contract report 2C. Dept. of the Army project: 3-99-15-022. Signal Corps project: 32-152B. PU PL TR 34C.

Development of a heat resistant foamed-in-place low density silicone resin core material. Dow Corning Corporation, Midland, Mich. Under Contract AF 33(600)-6320, by Kenneth R. Hoffman and Donald E. Meyer. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Progress report no. 2. May 1952. 20p graphs, tables Microfilm $2.00, Photocopy $2.75. PB 115514

1. Sandwich construction - Core materials 2. Resins, Silicone - Properties 3. Foams, Plastic - Thermal properties.

Progress report no. 3. Jun 1952. 22p photo, graphs, tables Microfilm $2.25, Photocopy $4.00. PB 115515

1. Sandwich construction - Core materials 2. Resins, Silicone - Properties 3. Catalysts, Cobalt - Effects 4. Foams, Plastic - Thermal properties.

Progress report no. 4. Jul 1952. 18p photos, graphs, tables Microfilm $2.00, Photocopy $2.75. PB 115516

1. Sandwich construction - Core materials 2. Foams, Plastic - Thermal properties 3. Foams, Plastic - Microscopy 4. Resins, Silicone - Thermal properties.

Progress report no. 5. Aug 1952. 19p photos, tables Microfilm $2.00, Photocopy $2.75. PB 115517

1. Sandwich construction - Core materials 2. Unicel (Trade name) 3. Foams, Plastic - Thermal properties 4. Resins, Silicone - Thermal properties.

Progress report no. 6. Sep 1952. 22p tables Microfilm $2.25, Photocopy $4.00. PB 115518

1. Sandwich construction - Core materials
2. Foams, Plastic - Thermal properties
3. Resins, Silicone - Thermal properties.

Progress report no. 11. Feb 1953. 14p. Microfilm $2.00, Photocopy $2.75. PB 115519

1. Sandwich construction - Core materials
2. Resins, Silicone - Thermal properties
3. Foams, Plastic - Thermal properties.

Effects of laminating pressure on the mechanical strength of glass-fabric polyester laminates, by J. E. Wier and D. C. Pons. U. S. National Bureau of Standards. Sep 1953. 80p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 111506

The effects of laminating pressure and mold type on the mechanical strength and related properties of woven glass-fiber reinforced plastics were determined on laminates bonded with three commercial resins and laminated at four pressures in both closed molds and between open platens to allow free flow through the sides. A diallyl phthallate and two polyesters were selected for laminating. Prepared under USAF PO no. (33-038)-50-1463-E. AAF WADC TR 52-75.

Effect of synthetic resin adhesives on the strength and physical properties of wood veneer laminates, by Stephen B. Preston. Yale University. School of Forestry, New Haven, Conn. 1954. 94p photos, graphs, tables Available from Yale University School of Forestry, 205 Prospect St., New Haven 11, Conn. $1.50. PB 115329

Bulletin no. 60.
1. Veneers, Plastic coated 2. Adhesives, Synthetic 3. Plywood - Mechanical properties 4. Wood, Laminated - Mechanical properties 5. Wood, Laminated - Physical properties.

Heat-resistant thermosetting molding materials. Quarterly development report no. 11 for quarter ending Nov 1953 under Contract DA 36-039-sc-5483, by S. Kaganoff. Federal Telecommunication Laboratories, Nutley, N. J. Nov 1953. 26p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115298

The effect of molding time and after-cure on the flexural properties of fast-curing molding material employing Cobalt Hexogen-strontium naphthenate as a two-component catalyst was investigated. Dept. of the Army project no. 3-93-00-503. Signal Corps project no. 32-2005-33.

Chemical Engineering and Equipment

Fire fighting foams, their characteristics and physical properties, by C. S. Grove, Jr. and L. L. Golub. Syracuse. University. Institute of Industrial Research, Syracuse, N. Y. 1951? 76p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115322

Report presents, briefly, some of the important information available in the literature on the flow properties of air-water foams and on other characteristics of foams, which are of importance in studying its flow properties. In addition to foam properties, the relationships between the properties of the foaming agent and the properties of the foam produced from it have been included. Contracts ONR 248-04, 248-09, and 303-00. "Literature cited" and "Annotated bibliography," p. 30-72.

Miscellaneous Chemicals

Catalytic synthesis of hydrazine from ammonia. Battelle Memorial Institute, Columbus, Ohio. Under Contract no. AF 33(038)-2030. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

First bimonthly progress report from Aug 15, 1949 to Oct 15, 1949, by J. N. Pattison, T. J. Hanratty, J. J. Ward and J. W. Clegg. Nov 1949. 13p drawings, graph, table Microfilm $2.00, Photocopy $2.75. PB 115381

During this period past findings were reviewed, and a research program planned. Methods of reducing product decomposition will be sought by studying wall coatings and reactor design. The equipment for this work was assembled, and the data for some confirmatory runs in the decomposition reactor are presented.

Second bimonthly progress report from Oct 15, 1949 to Dec 15, 1949, by J. N. Pattison, T. J. Hanratty, G. F. Sachsel, J. J. Ward and J. W. Clegg. Jan 1950. 22p drawings, fold graph, tables (part fold) Microfilm $2.25, Photocopy $4.00. PB 115382

The work reported in this report was directed toward reduction of hydrazine decomposition by wall coatings, and a re-examination of two manganese oxide catalysts.

Third bimonthly progress report from Dec 15, 1949 to Feb 15, 1950, by J. W. Pattison, T. J. Hanratty, G. F. Sachsel, J. J. Ward, and J. W. Clegg. Mar 1950. 42p photos, diagrs, graph, fold tables Microfilm $2.75, Photocopy $6.50. PB 115383

Progress is reported in the development of a catalytic synthesis of hydrazine from ammonia. Emphasis was placed on the retardation of hydrazine composition. Electron diffraction studies were made before and after passivation. A few catalysts which produced hydrazine by reaction between ammonia and nitrous oxide in a silica reactor were screened in a passivated Pyrex reactor.

Fifth bimonthly progress report from Apr 15, 1950 to Jun 15, 1950, by J. N. Pattison, T. J. Hanratty, G. F. Sachsel, J. J. Ward and J. W. Clegg. Jul 1950. 23p photo, diagr, tables (part fold) Microfilm $2.25, Photocopy $4.00. PB 115385

A number of new materials were screened for their effects upon the decomposition of hydrazine. These included nickel, tantalum, tungsten, zirconium, brass, bronze, molybdenum, Sillimanite, and Vycor coated with sodium chloride. Table 35 and diagr will not reproduce well.

Final report covering work done from Aug 15, 1950, by J. N. Pattison, T. J. Hanratty, G. F. Sachsel, J. E. Yocum, R. Q. Wilson, J. J. Ward and J. W. Clegg. Oct 1950. 147p photos, diagrs, graphs, tables (part fold) Microfilm $6.00, Photocopy $19.00. PB 115392

The present report summarizes all the research conducted during the one-year contract.

Catalytic synthesis of hydrazine. Olin Industries Inc., East Alton, Ill. Under Contract no. W33-038-ac-21430. Project 4-S98-B. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Progress report no. 4, Jan 1, 1949-Feb 28, 1949, by E. O. Holmes, L. D. Moore, and G. L. MacCurdy. Mar 1949. 18p tables (1 fold) Microfilm $2.00, Photocopy $2.75. PB 115384

1. Hydrazine - Synthesis 2. Hydrazine - Decomposition 3. Ammonia - Catalysts 4. Ammonia - Chlorination 5. Ammonia - Fluorination.

Progress report no. 5, Mar 1, 1949-Apr 30, 1949, by E. O. Holmes and L. D. Moore. May 1949. 24p photos, fold table Microfilm $2.25, Photocopy $4.00. PB 115393

The experimental results late and some early experimental techniques have been reviewed and critically analyzed. Equations for the enthalpy of formation and the free energy formation of liquid hydrazine as functions of temperatures are included. Some pages will not reproduce well.

Progress report no. 6, May 1, 1949-Jun 30, 1949, by E. O. Holmes and L. D. Moore. Jun 1949. 18p graph, fold tables Microfilm $2.00, Photocopy $2.75. PB 115386

1. Hydrazine - Synthesis 2. Hydrazine - Decomposition 3. Ammonia - Catalysts 4. Ammonia - Chlorination 5. Ammonia - Oxidation.

Progress report no. 7, Jul 1, 1949-Aug 31, 1949, by Jack D. Bush and L. Dow Moore. Aug 1949. 21p drawings (1 fold), graphs, fold tables Microfilm $2.25, Photocopy $4.00. PB 115387

1. Hydrazine - Synthesis 2. Hydrazine - Synthesis - Apparatus - Design 3. Ammonia - Catalysts 4. Ammonia - Oxidation 5. Nitrogen oxides - Hydrogenation.

Progress report no. 8, Sep 1, 1949-Oct 31, 1949, by Jack D. Bush and L. Dow Moore. Oct 1949. 33p fold drawing, diagr, graphs Microfilm $2.50, Photocopy $5.25. PB 115388

1. Hydrazine - Synthesis 2. Hydrazine - Synthesis - Apparatus - Design 3. Hydrazine - Decomposition 4. Nitrogen oxides - Decomposition.

Progress report no. 9, Nov 1, 1949-Dec 31, 1949, by Jack D. Bush and L. Dow Moore. Dec 1949. 45p photos, diagrs, graphs, tables Microfilm $2.75, Photocopy $6.50. PB 115389

1. Hydrazine - Synthesis 2. Hydrazine - Decomposition 3. Ammonia - Catalysts 4. Ammonia - Decomposition 5. Nitrogen oxides - Determination - Apparatus.

Progress report no. 10, Jan 1-Feb 28, 1950, by Jack D. Bush and L. Dow Moore. Feb 1950. 37p fold drawing, graphs, tables Microfilm $2.50, Photocopy $5.25. PB 115390

1. Hydrazine - Synthesis 2. Hydrazine - Synthesis - Apparatus - Design 3. Hydrazine - Decomposition - Effect of nitrogen oxides 4. Nitrogen oxides - Decomposition 5. Ammonia - Catalysts.

Final summary report, submitted by R. L. Womer. Jun 1950. 9p Microfilm $1.50, Photocopy $1.50. PB 115394

1. Hydrazine - Synthesis 2. Hydrazine - Decomposition 3. Ammonia - Catalysts 4. Nitrogen oxides - Decomposition.

Chemical products and processes: Government-owned inventions available for license. U. S. Government Patents Board. Oct 1954. 106p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $3.00. PB 111465

1. Chemicals - Patents - Bibliography 2. Plastics - Manufacture - Patents - Bibliography 3. Rubber - Manufacture - Patents - Bibliography 4. Drugs - Manufacture - Patents - Bibliography 5. Insecticides - Manufacture - Patents - Bibliography 6. Explosives - Manufacture - Patents - Bibliography 7. Fertilizers - Manufacture - Patents - Bibliography 8. GPB PA 2.

Chemical reactions in strong shock waves, by Edward F. Greene. Brown University. Metcalf Research Laboratory, Providence, R. I. Dec 1953. 18p photo, diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111512

Strong shock waves, generated in shock tubes, provide a promising way of studying high temperature chemical reactions in gases. The heating by the shock wave is uniform, extremely rapid and intense so that the temperature may rise many thousands of degrees in a fraction of a microsecond. Observations of the effects of this heating on compounds like CH_3I and BrCN have shown extensive decomposition into such radicals as CH, C_2, and CN. Contract **Nonr-562**(06) NR-357-275. Technical report no. 1.

Cooling of a gas by radiation, by Ernest Bauer and Ta-You Wu. New York University. Institute of Mathematical Sciences. Div. of Electromagnetic Research. 1954. 34p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 111517

A mathematical treatment of the problem. Application also made to upper atmosphere and to nocturnal drop of temperature. Contract no. AF 19(122)-463. NYU RR CX-14.

Development of a method for the electrochemical formation of perchlorate from chlorate in which the use of platinum is avoided. Final report under Contract Nonr-1213(00), May 1-Oct 31, 1953, by James W. Hackett, Morton A. Fineman, J. Joseph Hanley, Otto Reitlinger. Providence College. Dept. of Chemistry, Providence, R. I. Dec 1953. 37p diagr, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 111511

1. Perchlorates - Production - Electrochemical methods 2. Platinum - Substitutes 3. Anodes - Materials 4. Anodes - Testing equipment 5. Anodes, Magnesium dioxide 6. Anodes, Platinum.

Gravimetrisk gasanalysmetod (A gravimetric method of gas analysis), by Johan Morsing. Sweden. Statens Provningsanstalt, Stockholm. 1954. 18p photo, drawings, tables (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115397

Summary in English.
1. Gas analysis - Methods - Sweden 2. Gravimetric analysis - Sweden 3. Sweden. Statens Provningsanstalt, Stockholm. Meddelande 114.

ELECTRICAL MACHINERY

Communication Equipment

Automatic responder beacon. National Research Council of Canada. Radio and Electrical Engineering Division. Jun 1954. 12p photos, diagrs, map Available from National Research Council of Canada, Radio and Electrical Engineering Division, Ottawa, Canada. PB 115332

1. Radio beacons - Design - Canada 2. Radio beacons - Operation - Canada.

Electronics

Basic methods for the calibration of sonar equipment. U. S. National Defense Research Committee. 1946. 82f photos, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Enlargement Print $12.75. PB 115485

Contents: 1. Introduction, by Robert S. Shankland. - 2. Operation and application of underwater sound devices, by Leslie L. Foldy. - 3. Generalized theory of electroacoustic transducers, by Leslie L. Foldy and Henry Primakoff. - 4. Types of acoustic measure ments, by Eginhard Dietze. - 5. Testing techniques, by Leslie L. Foldy. - 6. Description and operating procedures of the USRL test stations, by Erhard Hartmann and Earle C. Gregg, Jr. - 7. Computation from test data, by Eginhard Dietze and Pauline Leighton. - 8. Production and testing of sonar transducers, by Erwin F. Shrader. - 9. Acoustic equipment associated with underwater sound devices: Domes and baffles, by Henry Primakoff and Joseph B. Keller. - Glossary - Bibliography - Contracts.
1. Sonar - Calibration 2. Acoustic measurements 3. Baffles, Acoustic 4. Domes - Acoustic properties 5. Sound, Underwater - Detection 6. Instruments, Measuring - Acoustic 7. Transducers, Electroacoustic - Theory 8. Transducers, Electroacoustic - Tests 9. NDRC Div 6, vol. 10.

Development of harmonic mode crystals. Final report on modification #3 of Contract no. W36-039-sc-32136, by J. M. Wolfskill, R. T. Schlaudecker, J. K. Sterrett, H. C. Perry. Bliley Electric Co., Erie, Pa. Jun 1949. 83p photos, drawings, diagrs (part fold), graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115059

Dept. of the Army project: 3-24-02-021. Signal Corps project: 862A-5 (C540.2). Item 7(b). For final report on original contract see PB 98307; for final report on Modification 1 of Contract, see PB 98307r.
1. Crystals, Quartz 2. Crystals - Holders 3. Crystals - Manufacture.

Diffraction of pulses by a circular cylinder, by F. G. Friedlander. New York University. Institute of Mathematical Sciences. Div. of Electromagnetic Research. Apr 1954. 43p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115215

This paper deals with the diffraction of a sound pulse due to an instantaneous line source by a parallel, rigid, fixed circular cylinder. Contract AF 19-(122)-42. NYU RR EM-64.

Dual-channel rotary joint for 3300 Mc, by Martin J. Votaw. U. S. Naval Research Laboratory. Aug 1954. 7p drawings, diagrs, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115441

A dual-channel rotary joint with 7/8-in. coaxial line fittings has been developed for an airborne S-band antenna. A Teflon-filled coaxial line is carried inside the inner conductor of an air-filled line. Mechanical arrangement of the joint is designed to fit a particular antenna pedestal and to withstand the vibration and corrosion specifications of AN-E-19. NRL R 4398.

Electronic structure of solids. II: The perturbed periodic lattice, by John C. Slater. Massachusetts Institute of Technology. Solid State and Molecular Theory Group. Dec 1953. 83p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115261

Contract N5ori-07856. For Part I see PB 113526.
1. Solids - Electronic theory 2. Solids - Crystal structure - Theory 3. Wannier function 4. Mathematical equations and solutions 5. MIT SMT TR 5.

IFF antenna for mounting on the wing of a TBM torpedo bomber, by Ingo Maddaus, Jr. Massachusetts Institute of Technology. Radiation Laboratory. Dec 1945. 11p photos, drawing, diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 104816

Contract OEMsr-262.
1. Antennas, Radar - Design 2. Radar, IFF - Installation 3. NDRC Div 14 4. MIT Rad Lab 842.

Interaction of electrons and R-F fields. Technical report no. 1, covering the period Mar 1, 1953-Dec 1, 1953, prepared under Contract no. 1147-01, by W. G. Worcester and J. C. Twombly. Colorado. Engineering Experiment Station, Boulder, Colo. Dec 1953. 33p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115243

This report describes the measurements that have been made on a simple beam-tester tube, including preliminary noise measurements. A method for calculating the sensitivity of a "honeycomb" grid as a detector is outlined, and some results of the calculations are given.

Quarterly progress report, Apr-Jun 1954, by R. H. Bolt and R. D. Fay. Massachusetts Institute of Technology. Acoustics Laboratory. Jun 1954. 26p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115554

1. Acoustic research 2. Analyzers, Speech 3. Ultrasonics - Research 4. AAF CRC TN 54-183.

Recommended designations of radar indicator types, by R. F. Bacher, L. N. Ridenour, J. H. Cook. Massachusetts Institute of Technology. Radiation Laboratory. Jan 1942. 5p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 110303

Contract OEMsr-262.
1. Radar - Indicators - Design 2. NDRC VIII-IS 3. MIT Rad Lab 159.

Research services and investigations on subminiature multielement diodes and bistable elements for microtronic circuit. Quarterly progress report no. 3, second series, for period Apr 24 to July 23, 1954 under Contract no. AF 19(604)-55, by E. B. Dale, M. Genser, M. W. Aarons, M. Pobereskin, J. E. Gates, W. Allred, and C. S. Peet. Battelle Memorial Institute, Columbus, Ohio. Aug 1954. 36p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115274

For 1st-2d reports see PB 114627, 115054.
1. Vacuum tubes, Diode - Miniaturization 2. Circuits, Microtronic - Elements 3. Gold - Electrodeposition 4. Silicon - Purification 5. AAF CRC TN 54-181.

Theory of electromagnetic corrections to geometrical optics, by Ralph D. Kodis. Mar 1954. 9p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115227

Report no. 3 under Contract no. AF 19(604)-786. Includes Investigation of optical current distributions, by D. B. Brick. For Report no. 1 see PB 113688.
1. Optics, Geometrical - Theory 2. Waves, Electromagnetic - Scattering - Theory.

Generators, Motors, Transmission

Investigation of printed circuit methods for three dimensional applications. Sylvania Electric Products, Inc. Transformer Dept., Ipswich, Mass. Under Contract no. AF 33(616)-486. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Interim engineering report no. 1, for the period from 9 Mar 1953 to 9 Jun 1953. Jun 1953. 23p photos, diagr, tables Microfilm $2.25, Photocopy $4.00. PB 115216

1. Transformers - Design 2. Circuits, Electronic - Printed 3. Circuits, Electronic -

Printed 4. Circuits, Electronic - Printed - Photoelectroplating 5. Screens, Printing - Silk 6. Metals - Vacuum deposition.

Interim engineering report no. 2, for the period from 9 Jun 1953 to 9 Sep 1953, by Albert Zack. Sep 1953. 32p photos, drawings, tables Microfilm $2.50, Photocopy $5.25. PB 115217

1. Transformers - Design 2. Transformers - Circuits - Production - Methods 3. Circuits, Electronic - Printed - Photoetching 4. Circuits, Electronic - Printed - Photoelectroplating 5. Foils, Laminated - Winding.

Interim engineering report no. 3, for the period from 3 Sep 1953 to 9 Dec 1953, by Albert Zack. Dec 1953. 45p photos, drawings (1 fold), tables Microfilm $2.75, Photocopy $6.50. PB 115218

1. Transformers - Design 2. Circuits, Electronic - Printed 3. Transformers - Circuits - Assembling methods 4. Automan (Assembly device).

Search for new nongaseous, nonliquid rectifying systems. Battelle Memorial Institute, Columbus, Ohio. Under Contract no. AF 33(038)-2460. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

1st interim engineering report for period Jun 15, 1949 to Aug 15, 1949, by A. E. Middleton, O. J. Mengali, and L. R. Jackson. Aug 1949. 54p photos, diagrs (1 fold), graphs, tables Microfilm $3.00, Photocopy $7.75. PB 115420

The band theory of solids is briefly reviewed. A more detailed consideration of the nature and dependencies of the rectifying barrier is given. The operation of the rectifier is discussed with the help of barrier theory and energy-level diagrams. The natures of commercial materials are discussed in terms of the needs for finding new rectifying systems.

3d interim engineering report for period Oct 15, 1949 to Dec 15, 1949, by A. E. Middleton, O. J. Mengali, and L. R. Jackson. Dec 1949. 30p diagrs, graphs, tables Microfilm $2.25, Photocopy $4.00. PB 115431

1. Rectifiers - Materials - Electrical properties 2. Contacts, Electric - Materials - Tests 3. Selenides - Preparation - Methods 4. Tellurides - Preparation - Methods 5. Titanium dioxide - Electrical properties.

4th interim engineering report for period Dec 15, 1949 to Feb 15, 1950, by A. E. Middleton, O. J. Mengali, and L. R. Jackson. Feb 1950. 26p diagrs (1 fold), graphs, tables Microfilm $2.25, Photocopy $4.00. PB 115412

Various titanates, zirconates, and silicides have been prepared and evaluated for rectifying properties.

5th interim engineering report for period Feb 15, 1950 to Apr 15, 1950, by A. E. Middleton, O. J. Mengali, and L. R. Jackson. Apr 1950. 26p diagrs, tables Microfilm $2.25, Photocopy $4.00 PB 115413

Various selenides were prepared and evaluated for rectifying properties. Two borides and one arsenide were produced and evaluated. The effects of production methods on rectifying action are discussed. Methods of production of silver selenide versus type of rectification observed are analyzed. An experiment on determining the relationship between the energy separation of full and empty energy bands and the temperature at which rectification disappears in well known and promising rectifier materials are discussed.

6th interim engineering report for period Apr 15, 1950 to Jun 15, 1950, by A. E. Middleton, O. J. Mengali, and L. R. Jackson. Jun 1950. 38p photo, diagrs (1 fold), tables Microfilm $2.50, Photocopy $5.25. PB 115422

The survey of materials for rectification during this period has been concentrated on selenides and tellurides. The number of these materials prepared was chiefly determined by whether the methods of preparation being investigated would form compounds between the metals and the selenium or tellurium. Two methods of formation of selenides and tellurides were considered.

7th interim engineering report for period Jun 15, 1950 to Aug 15, 1950, under Contract no. AF 33(038)-2460, by A. E. Middleton, O. J. Mengali, and L. R. Jackson. Aug 1950. 34p diagrs, tables (1 fold) Microfilm $2.50, Photocopy $5.25. PB 115423

Tellurides and selenides were prepared by a new method of production. High-temperature point-contact-rectification tests were conducted on all tellurides and selenides produced by both the Chemical Methods A and B and the reduction methods discussed.

13th interim engineering report for period Nov 15, 1951 to Feb 15, 1952, by C. S. Peet, O. J. Mengali, R. C. Sirrine, and A. E. Middleton. Feb 1952. 27p graphs Microfilm $2.25, Photocopy $4.00. PB 115432

Various methods of preparing TiO_2 rectifiers were investigated, the effects of temperature variations on TiO_2 rectifiers were studied, and theoretical analyses of experimental data on TiO_2 rectifiers were initiated.

14th interim engineering report for period Feb 15, 1952 to May 15, 1952, by C. S. Peet, O. J. Mengali, R. C. Sirrine, and A. E. Middleton. May 1952. 30p diagr, graphs, table Microfilm $2.25, Photocopy $4.00. PB 115433

The current-voltage and capacitive characteristics for both Ni-TiO_2 and Cu-TiO_2 rectifiers were studied for temperatures between room temperature and 200 C. These data were analized by use of the diffusion theory of rectification.

16th interim engineering report for period Aug 15, 1952 to Nov 15, 1952, by T. S. Shilliday, Q. Van Winkle, H. Goering, C. S. Peet, and A. E. Middleton. Nov 1952. 25p graphs, tables Microfilm $2.25, Photocopy $4.00. PB 115435

Work was initiated on a program designed to (a) standardize oxidizing conditions for commercial titanium, (b) prepare and study the oxidizing characteristics of high-purity titanium, and (c) improve the rectifier characteristics by chemical and physical alterations in the semiconductor near the surface next to the counterelectrode.

17th interim engineering report for period Nov 15, 1952 to Feb 15, 1953, by T. S. Shilliday, O. J. Mengali, C. S. Peet, and A. E. Middleton. Feb 1953. 25p diagrs, graphs Microfilm $2.25, Photocopy $4.00. PB 115436

Improved rectifier test equipment was designed, constructed, and put into operation. Experiments were conducted to determine whether or not the method of vapor depositing counterelectrodes on TiO_2 films affected the results.

18th interim engineering report for period Feb 15, 1953 to May 15, 1953, by T. S. Shilliday, O. J. Mengali, C. S. Peet and A. E. Middleton. May 1953. 28p diagr, graphs, tables Microfilm $2.25, Photocopy $4.00. PB 115437

The effects of thermal diffusion of metallic elements into TiO_2 films on titanium were investigated. Anodization of TiO_2 films on titanium was investigated as a possible method for improving the electrical properties of the films.

19th interim engineering report for period May 15, 1953 to Aug 15, 1953, by T. S. Shilliday, O. J. Mengali, C. S. Peet, and A. E. Middleton. Aug 1953. 27p graphs, tables Microfilm $2.25, Photocopy $4.00. PB 115438

Observations pertinent to the state of development of the rectifier now as compared with a year ago show that marked advances have been made in (a) current-voltage characteristics, (b) reverse resistance, (c) electrical stability, (d) reproducibility, and (e) surface electrical uniformity. A recent evaluation carried out on current experimental specimens has shown that rectifiers can be made in significant numbers with leakages of 10 to 100 milliamperes per square inch at 20 volts reverse. These same specimens will pass a forward current of one ampere per square inch at 1 to 6 volts forward.

20th interim engineering report for period Aug 15, 1953 to Nov 15, 1953, by T. S. Shilliday and C. S. Peet. Nov 1953. 34p diagr, graphs, tables Microfilm $2.50, Photocopy $5.25. PB 115439

1. Rectifiers - Filling materials 2. Rectifiers, Titanium dioxide 3. Rectifiers, Bismuth-titanium-dioxide 4. Bismuth - Electrodeposition.

21st interim engineering report for period Nov 15, 1953 to Feb 15, 1954, by T. S. Shilliday and C. S. Peet. Feb 1954. Microfilm $2.00, Photocopy $2.75. PB 115440

Methods for rectifier rating have been investigated, techniques and equipment necessary for rating prototype TiO_2 rectifiers have been designed, and some of the required equipment has been constructed and tested.

Services, facilities and materials required for research and development of accurate fixed, non-wire-wound resistors. Final progress report, 15 Nov 1952 to 15 Feb 1953, under Contract no. DA 36-039-sc-15341, by Joseph W. Jira. Continental Carbon, Inc., Cleveland, Ohio. Feb 1953. 105p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photocopy $14.00. PB 115407

Dept. of the Army project no. 3-26-00-600. Signal Corps project no. 32-2006-31.
1. Resistors, Fixed - Design 2. Resistors, Fixed - Materials 3. Resistors, Non-wire-wound 4. Films, Metallic - Deposition 5. Coatings, Enamel 6. SIG Contract DA 36-039-sc-15341, Final report.

Miscellaneous

Comments on optimum Dolph current distributions, by Henry J. Riblet. Final report, Jun 26, 1953 to Jun 26, 1954, under Contract AF 19(604)-829. Microwave Development Laboratories, Inc., Waltham, Mass. Jun 1954. 16p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115546

This report considers the limiting current distribution and pattern of an array of discreet radiating elements, excited to yield a Dolph-Tchebycheff pattern, as the number of elements becomes infinite for a fixed length of array. The realizability and utility of this distribution is considered, and the consequences of the condition for a continuous limit are discussed. Comparisons are made with the patterns of a uniform and a cosine distribution, as well as a Dolph-Tchebycheff pattern for half wave spacing. AAF CRC TR 54-154.

Determination of foam density by electrical conductivity, by C. S. Grove, Jr., Emanuel Vanzo, Jr. and Norman Radow. Syracuse. University. Institute of Industrial Research, Syracuse, N. Y. 1951? 19p diagrs, graphs (1 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115323

Report no. 9 on Projects ONR 248-04, 248-09, and 303-00.
1. Foaming agents - Electrical properties 2. Fire extinguishers, Foam 3. Electric conductivity - Measurements - Apparatus.

Progress report for April - June 1954. National Research Council of Canada. Radio and Electrical Engineering Division. Jul 1954. 22p photos Available from National Research Council of Canada, Radio and Electrical Engineering Division, Ottawa, Canada. PB 115341

1. Navigational aids - Canada 2. Tubes, Electron - Research - Canada 3. Electromedical research - Canada 4. Engineering, Electrical - Research - Canada 5. Dielectric research - Canada 6. Noise, Solar - Research - Canada 7. Wave propagation - Research - Canada 8. NRCC ERA-274.

Report of the Canadian National Committee of Union Radio Scientifique Internationale (U.R.S.I.), submitted to the XIth General Assembly of U.R.S.I., The Hague, Netherlands, Aug 23-Sept 2, 1954, by D. W. R. McKinley, Chairman, Canadian National Committee of U.R.S.I. Union Radio Scientifique Internationale. Canadian National Committee. Jun 1954. 45p Available from National Research Council of Canada, Ottawa, Canada. $.75. PB 115293

1. Ionospheric measurements 2. Radio astronomy - Research 3. Electronics - Research 4. Radio - Research 5. Atmospherics - Waves 6. Radio waves - Atmospheric effects 7. Radio waves - Propagation - Theory 8. Radio waves - Propagation - Troposphere 9. National Research Council of Canada 10. NRCC 3330.

Some techniques for network synthesis, by George L. Matthaei. California. University. Div. of Electrical Engineering. Electronics Research Laboratory, Berkeley, Calif. Dec 1953. 37p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115241

1. Networks, Electrical - Synthesis 2. UC IER Series 60, Issue no. 103.

Stability of nonlinear feedback control systems, by J. Frank Koenig. U. S. National Bureau of Standards. Aug 1954. 26p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115464

To be presented at AIEE meeting, Chicago, Ill., Oct 11-15, 1954.
1. Controls, Feed-back - Theory 2. NBS 3619.

FOOD AND KINDRED PRODUCTS

Cathode ray sterilization of perishable foods, by B. E. Proctor, E. E. Lockhart, S. A. Goldblith. Report no. 1 (termination), June 1, 1952 thru 30 Nov 1952, on Contract DA 11-009-qm-18846, Project no. 7-84-06-026. U. S. Quartermaster Food and Container Institute. 1952. 34p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115310

A preliminary study of the effects of three different doses of cathode rays on two ration components, frozen concentrated orange juice and beef sausage. The observations were on changes in vitamin content, flavor, and microbial population resulting from exposure to the ionizing radiations.

Dehydration of cling stone peaches, by E. M. Mrak, J. H. Kilbuck, M. W. Miller and J. Recca. Report no. 4 (Termination), 1 May 1952 - 30 April 1953. U. S. Quartermaster Food and Container Institute. 1953. 30p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115306

The greater part of this investigation is concerned with the effects of dehydration temperatures, moisture content of the dried fruit, and storage temperatures on the storage life of dehydrated cling stone peaches. Contract DA11-009-qm-13188, Project 7-84-06-028.

Determination of the effectiveness of dielectric heating in processing of comminuted meat, by D. M. Doty, C. F. Niven, Jr., L. J. Pircon, Peter Loquercio, Edmund Golbeck, Alan Wolin, and Richard Lechowich. Report no. 12 (termination), June 1, 1952-June 1, 1953, on Contract DA 11-009-qm-18561, Project 7-84-06-026. U. S. Quartermaster Food and Container Institute. 1953. 27p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115313

This research has included the investigation of the effectiveness of high frequency heating for processing the following items: 1. Pork luncheon meat (cure in); 2. Ground fresh pork; 3. Ground beef (hamburger) containing 12% fat; and 4. Ground beef (hamburger) containing 25% fat.

Effect of dehydration and rehydration on the histological and histochemical characteristics of beef, by Hsi Wang, Earl Auerbach, Nehema Maynard, and Virginia Bates. Report no. 7 (Termination report), 1 Jun 1952 to 1 October 1953. U. S. Quartermaster Food and Container Institute. 1953. 70p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 115305

The work covers 4 phases. Phase I. Preliminary experiments on effect of low-temperature dehydration with some samples pre-treated with electrolysis. Phase II. Experiments to elucidate the histology, histochemistry, and rehydration of frozen-dried muscle tissue. Phase III. An analysis of core-containing samples of muscle tissue, incompletely frozen-dried and finished off at higher temperatures under vacuum. Phase IV. Factors that influence the rate and level of rehydration of

frozen-dried muscle tissue. Contract DA11-099-qm-18557, Project no. 7-84-06-026.

Effect of limitations of moisture on the growth of bacteria, by H. O. Halvorson and D. G. Waldhalm. Report no. 6 (termination), 16 June 1952-16 Sep 1953, on Contract DA 11-009-qm-19755, Project no. 7-84-17-012. U. S. Quartermaster Food and Container Institute. 1953. 31p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115309

The relationship between moisture content and equilibrium vapor pressure for spores and vegetative cells of a number of genus Bacillus was studied.

Effect of variations in the composition of milk with special reference to fat on the dispersibility of dehydrated milk, by I. A. Gould and H. J. Bassett. Report no. 12 (termination), 1 June 1952 through 31 May 1953, on Contract DA 11-009-qm-19886, Project 7-84-06-029. U. S. Quartermaster Food and Container Institute. 1953. 24p tables Available from Library of Congress, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115312

Milk powders ranging from a milk fat content of 1.0% to 36.0% were manufactured and the dispersibility characteristics were determined.

Factors affecting heat resistance of spores of Clostridium botulinum, by G. M. Dack, H. Sugiyama and C. J. Cichon. Report no. 20 (Termination report), 1 Oct 1951 thru 30 Sep 1952. U. S. Quartermaster Food and Container Institute. 1952. 2p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115307

Contract DA11-009-qm-13159, Project 7-84-17-012.
1. Clostridium botulinum - Spores - Heat resistance
2. Chicago. University. Division of Biological Sciences. Food Research Institute.

Food products and processes: Government-owned inventions available for license. U. S. Government Patents Board. Oct 1954. 26p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111466

1. Food - Manufacture - Patents - Bibliography
2. Food - Preservation - Patents - Bibliography
3. GPB PA 3.

Fractionation-crystallization of butterfat for production of a spread, by K. G. Weckel and Jolyon A. Stein. Report 7 (termination), Oct 1, 1951 to Sep 30, 1952, on Contract DA 11-009-qm-14186, Project 7-84-06-029. U. S. Quartermaster Food and Container Institute. 1952. 21p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115318

Work divided into 4 phases. Phase I. The fractional crystallization of butterfat; Phase II. Determination of some chemical and physical properties of fractionally crystallized butterfat; Phase III. Formulation of dairy spreads containing fractionally crystallized butterfat; and Phase IV. The drying of a low-fat dairy spread. Each phase embodies: summary, materials and methods, results and discussion, and a bibliography. Tables and graphs included.

Improving standard rations - confections, by J. C. Woodroof. Report no. 11 (termination), June 1, 1952 to 31 May 1953, on Contract DA 11-009-qm-18402, Project 7-84-06-030. U. S. Quartermaster Food and Container Institute. 1953. 22p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115311

In an effort to extend storage life and provide a wider selection of confections, 12 types of candies with varying amounts of humectants or antioxidants were tested for 2 years storage under five temperature conditions.

In-package dessication of dehydrated foods, by Carl E. Hendel and Horace K. Burr. U. S. Dept. of Agriculture. Agric ltrual Research Service. Western Utilization Research Branch, Albany, Calif. Jun 1954. 18p photos, graph Available from U. S. Dept. of Agriculture, Western Utilization Research Branch, 800 Buchanan St., Albany, Calif. PB 115562

1. Foods - Dehydration 2. Foods - Packaging
3. Dessicants - Uses 4. Dessicants - Containers
5. AIC 373.

Incidence and survival of bacteria in fresh and processed beef, by John C. Ayres, Alonzo Adams, Mary Jeanne Fanelli, and Georgia Markakis. Report no. 28 (Termination report), 16 March 1952 - 15 March 1953. U. S. Quartermaster Food and Container Institute. 1953. 3p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115308

A survey to supplement existing data regarding the number and types of bacteria found in meat items at different processing stages; (1) The extent of contamination of fresh beef; (2) change in microbial population after handling, cutting and canning; and (3) the bacterial incidence in drain juice, extracted core and peripheral sections after the canned meat had undergone one of several thermal processes. Termination report, initiation date 15 Feb 1947, Contract D11-009-qm-16595, Project 7-84-17-012.

The mechanism of deteriorative changes in milk products, by S. T. Coulter, Herbert A. Harland and

Robert Jenness. Report no. 16 (Phase report), October 1, 1951-September 30, 1952. U. S. Quartermaster Food and Container Institute. 1952. 7p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115317

The following are considered: Part I. Factors influencing the development of "chalkiness" in dry whole milk; Part II. Extent of variability in the amount and properties of the serum protein in cow's milk as to the use of whey protein tests as indices of treatment. Phase report, initiation date 1 July 1946 on Contract DA 11-009-qm-12997, Project 7-84-06-029.

Methods for improving the dispersibility of powdered whole milk, by H. A. Hollender and D. W. Mather. Report no. 14 (Termination), 1 June 1952 - December 1953. U. S. Quartermaster Food and Container Institute. 1953. 20p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115304

It is possible to materially improve the rate of self-dispersion of whole milk powder by the addition of the proper combination of certain emulsifiers and/or wetting agents. There will be some loss in initial rate of self-dispersion during storage, but even after 12 months at 0°C. and/or 30°C. the powder containing the additive will be several times better than the one without and the beverage quality is improved. Note: parts of this report will not reproduce well. Contract DA11-009-2m-19248, Project no. 7-84-06-029.

Purification of oysters in simple pits, by H. A. Cole. Gt. Brit. Ministry of Agriculture and Fisheries. 1954. 16p photos, map, graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 115524

Fishery investigations, Series II, Vol. XVIII, no. 5.
S. O. code no. 24-52-18-5.
1. Oysters - Purification - Gt. Brit.

Quality and stability of canned meats, a symposium sponsored by the Quartermaster Food and Container Institute for the Armed Forces. Quartermaster Research and Development Command, U. S. Army Quartermaster Corps, Palmer House, Chicago, March 31-April 1, 1953. Edited by Robert G. Tischer, James M. Blair and Martin S. Peterson. U. S. Quartermaster Food and Container Institute. Jul 1954. 140p photos, drawings, diagrs, graphs, tables Available from U. S. Quartermaster Food and Container Institute for the Armed Forces, 1819 West Pershing Road, Chicago 19, Ill. PB 115260

Contents: I. Introduction. - Purpose and scope of the symposium, by D. K. Tressler. - Institute's program of investigation on canned meats, by B. W. Gardner, Jr. - II. Microbiological factors affecting the thermal resistance of bacterial spores, by Hiroshi Sugiyama. - Factors causing sporulation and vegetation of spoilage organisms in canned meats, by O. B. Williams. - Microorganisms associated with the spoilage of thermal processed meats, by John C. Ayres. - Study of the incidence of spoilage organisms in canned meat products manufactured under commercial conditions, by Charles Gross and Winston Ogilvy. - III. Mode and rate of heat transfer in canned meats. Effect of processing temperature upon the rate and pattern of heat distribution within a can of beef, by Robert G. Tischer. - Effect of ingredient arrangement on the rate of heat transfer in canned meat products, by C. Olin Ball. - Preliminary observations on the effect of can movement during thermal processing, by James M. Blair and K. T. Swartz. - Discussion. - IV. Canned meats of today. Why we need better canned meat products, by William Levin. - V. Potentialities of new methods of manufacturing. Potentialities of pressurized manufacturing facilities for producing canned meat products, by Horace L. Smith, Jr. - Potentialities of utilizing a continuous type of process in conjunction with aseptic canning for production of canned meat products, by John P. Bolanowski. - Effectiveness and potentialities of dielectric methods of heating for the production of canned meat products, by D. M. Doty, C. F. Niven, Jr. and Laddie Pircon. - Technological information obtained from storage studies on canned whole hams processed by intermittent heat treatment, by Joseph M. Stukis and K. T. Swartz. - Potentialities of utilizing radiation from fission materials for the production of canned meat products, by L. E. Brownell. - Potentialities of utilizing an electron bombardment treatment for the production of canned meat products, by S. A. Goldblith. - Concluding discussion.

Report of the Food Investigation Board with the report of the Director of Food Investigation for the year 1953. Gt. Brit. Dept. of Scientific and Industrial Research. Food Investigation Board. 1954. 63p photos, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 115543

S. O. code no. 47-7-0-53.
1. Food - Research - Gt. Brit. 2. Food - Inspection - Gt. Brit.

Role of starch in bread staling, by R. M. Sandstedt, Robert Gates, Paul H. Figard, James Fleming and R. Baumanis. Report no. 16 (termination), Sep 1, 1951 to Sep 30, 1952, on Contract DA 11-009-qm-13158, Project 7-84-06-027. U. S. Quartermaster Food and Container Institute. 1952. 24p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115316

The report covers fundamental information concerning structure of the starch granule, the forces responsible for that structure, and the changes taking place during gelatinization and subsequent staling.

Study of some chemical factors involved in the "browning" of certain food constituents, by C. D. Ball, John C. Speck, Jr. and Don S. Miyada. Report no. 22 (termination) Oct 1, 1951-Sep 30, 1952, on Contract DA 11-009-qm-13160, Project 7-84-

17-012. U. S. Quartermaster Food and Container Institute. 1952. 5p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115315

1. Food - Analysis - Browning 2. Michigan State College. Dept. of Chemistry, East Lansing, Mich.

Study of the chemical changes which result in browning in foods, by Charles D. Hurd and James Moffat. Report no. 22 (termination), Oct 1, 1951 thru Sep 30, 1952, on Contract DA 11-009-qm-14187, Project 7-84-17-012. U. S. Quartermaster Food and Container Institute. 1952. 17p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115314

A review is made of the known reactions of amines and amino acids with benzoin. Benzoin, acetoin, acetol and propionoin were selected as hydroxy ketones and regarded as model carbohydrate systems. Benzyl and p-chlorobenzaldehyde were included. Reaction of these compounds with several amines and amino acids was the basis of this investigation, the amines being benzylamine and pentylamine and the amino acids including glycine, alamine, leucine, p-aminophenylacetic acid, and three aminobenzoic acids.

FUELS AND LUBRICANTS

Development of qualification test methods for gear lubricants. Progress report no. 22 under Contract no. DA-11-022-ORD-905, by H. Ruwe Barton. Armour Research Foundation, Chicago, Ill. May 1954. 13p photo, diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115502

1. Axles - Lubrication - Tests 2. Gears - Lubrication - Corrosion tests 3. Lubricants - Tests 4. ARF Proj L030, Report no. 22.

Factors affecting the use of a smoke lamp for evaluating jet fuels, by J. A. Krvnitsky, W. D. Garrett, and C. A. McLean. U. S. Naval Research Laboratory. Oct 1952. 18p photo, drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115348

It was found that the method is rapid, has good reproducibility, and is not affected adversely by ambient temperature changes, burning time, small variations in the wick character, or by small differences in the barometric pressure. Fuels may be rated either by their absolute flame heights or by their Toluene Numbers which are obtained by comparison with a reference toluene/n-decane scale. NRL R 4068.

HIGHWAYS AND BRIDGES

Aerodynamic stability of suspension bridges, with special reference to the Takoma Narrows Bridge. Part V: Extended studies: Logarithmic decrement, field damping, prototype predictions, four other bridges, by George S. Vincent. Washington. University. Structural Research Laboratory. Jun 1954. 104p photos, drawings, diagrs, graphs, tables Available from Engineering Experiment Station, University of Washington, Seattle, Wash. PB 115470

Engineering Experiment Station Bulletin no. 116, part V. Report of an investigation conducted by the Structural Research Laboratory, University of Washington, under the direction of the Washington Toll Bridge Authority in cooperation with the Bureau of Public Roads, Dept. of Commerce.

1. Bridges, Suspension - Stability 2. Bridges, Suspension - Models 3. Takoma Narrows Bridge 4. Damping capacity - Theory 5. W EES B 116, Part 5.

Soil compaction investigation, report no. 6: Effect of size of feet on sheepsfoot roller, by W. J. Turnbull, C. R. Foster, O. B. Ray, E. C. Meredith, C. D. Burns, and A. B. Thompson. U. S. Waterways Experiment Station, Vicksburg, Miss. Jun 1954. 77p photos, graphs, tables Available from U. S. Waterways Experiment Station, Vicksburg, Miss. $1.00. PB 115406

1. Soils - Compaction 2. Road rollers, Sheepsfoot 3. WES TM 3-271.

Unified soil classification system. U. S. Waterways Experiment Station, Vicksburg, Miss. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Appendix A: Characteristics of soil groups pertaining to embankments and foundations. Mar 1953. 15p fold table Microfilm $2.00, Photocopy $2.75. PB 115555s

1. Soils - Classification 2. Embankments, Road - Soils 3. Foundation soils 4. WES TM 3-357, Vol. 2.

Appendix B: Characteristics of soil groups pertaining to roads and airfields. Mar 1953. 13p fold table Microfilm $2.00, Photocopy $2.75. PB 115555s2

1. Soils - Classification 2. Foundation soils - Landing fields 3. Foundation soils - Roads 4. WES TM 3-357, Vol. 3.

Winter roads on ice, by A. Wolff. Translated by William Dias. Apr 1954. 15p photos, drawings, diagrs, graph, table Available from Library of

of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115408

Translated from Svenska vagfovening, vol. 27, Dec 1940. Investigation of construction and maintenance of airdromes on ice, 1953-1954.
1. Bridges, Ice - Sweden 2. Roads, Icy - Treatment - Sweden 3. Ice - Sweden 4. U. S. Army. Corps of Engineers. New England Division. Arctic Construction and Frost Effects Laboratory, Boston, Mass.

INSTRUMENTS

Apparatus for measuring electrical charges and other properties of fog, by S. Darrell Reeder and Robert G. Paquette. Washington. University. Dept. of Oceanography, Seattle, Wash. Feb 1951. 44p photos, drawing, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115340

An apparatus is described which will measure the individual electrical charges and diameters of large numbers of droplets of natural fog and permit a direct determination of the particulate count. It is also applicable to other aerosols of a similar size range. Contract N8onr-520/III, Project NR 083-012. Technical report no. 4.

Change in the pH value and the acid content of grade C, specification JAN-B-121 barrier materials during aging in the Atlas weatherometer, model XW, by Arthur J. Dieroff. U. S. Arsenal, Rock Island, Ill. Jul 1954. 16p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115401

Ordnance project TB4-672D, Report no. 3. Dept. of the Army project no. 593-10-010.
1. Weatherometers - Materials - Analysis 2. Cellulose - Hydrogen ion cencentration - Effect of aging 3. Wax - Hydrogen ion concentration - Effect of aging 4. Cellulose - Acid content - Effect of aging 5. RIAL R 54-2442.

Computer components fellowship no. 347. Quarterly report no. 3, second series, Apr 1, 1954 to Jun 30, 1954 under Contract no. AF 19(604)-943. Mellon Institute of Industrial Research, Pittsburgh, Pa. Jun 1954. 90p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115560

Contents: I. Electro-optical devices, by F. A. Schwertz, A. Milch, M. N. Haller, J. J. Mazenko. - II. Alternating field (A.C.) electroluminescent light sources, by F. A. Schwertz, R. T. Steinback, J. J. Mazenko. - III. Stationary field (D. C.) electroluminescent light source, by F. A. Schwertz, M. N. Haller, A. Milch. - IV. Metal oxide and other insulating films, by A. Milch. - V. Transparent semiconducting oxide films, by F. A. Schwertz and R. T. Steinback. - VI. Printed circuitry via xerography, by M. N. Haller. AAF CRC TN 54-162.

Delay line controlled FM subcarrier discriminator for telemetering and frequency measurement, by K. A. Morgan and R. F. Blake. U. S. Naval Research Laboratory. Sep 1954. 16p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115475

The design has exceptionally good linearity and stability without requiring parts selection, and the output has been made essentially independent of tube characteristics. Linearities within $\pm 0.25\%$ can be readily obtained under field operating conditions when the equipment is used as a telemetering discriminator. The equipment weighs only three pounds and utilizes only six tubes. NRL R 4425.

Frequency method of analyzing intermittent regulatting systems, by Ya. Z. Tsypkin. U. S. National Bureau of Standards. Aug 1954. 34p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115465

Translated by S. Kassel from Avtomatika i Telemechanika, vol. 14, no. 1, p. 11-33.
1. Controls, Automatic - Frequency response characteristics - Russia 2. Linear systems - Analysis - Russia 3. Mathematical equations and solutions - Russia. 4. NBS 3620.

Instrumentation development. Quarterly report no. 5 under Contract no. N174s-10153. Reed Research, Inc., Washington, D. C. May 1954. 4p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 114445

Project RR-796.
1. Instruments - Research 2. U. S. Naval Powder Factory, Indian Head, Md.

Machine systems for accepting, storing, and searching engineering data on electronic components, by Roy A. Corby, Harold J. Behm, Alvin T. Maierson. Battelle Memorial Institute, Columbus, Ohio. Mar 1954. 164p photos (part fold), diagr, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $4.25. PB 111548

The report describes the elements of a machine-sorted punched-card system for recording, searching, and tabulating data on any electronic component. It presents detailed data sheets, definitions, codes, and instructions for processing input data on a typical component group (capacitors). A resume is presented of the work done toward the development of life-rating test methods and of that on automatic component-testing equipment. Also presented are discussions and studies on (1) the data-collecting problem, (2) suggested organization and

personnel requirements, and (3) cost estimates for building up and operating an ECIC. Final report on Contract AF 33(038)-1229, Dec 28, 1948-Mar 30, 1954. AAF WADC TR 54-151.

Operational suitability test of the lubricator, winterized, portable, Graco, by W. B. Putnam. U. S. Air Force. Air Proving Ground Command, Elgin Air Force Base, Fla. Mar 1954. 27p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115434

Project no. APG/CSC/272-B.
1. Lubricators - Tests 2. Graco lubricator.

Sensitive versatile acoustic gas analyzer particularly suitable for the analysis of anesthetic mixtures, by James E. Wilson. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 3p diagr, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115449

Details are given for the construction of a moderately simple acoustic gas analyzer which is capable of giving a rapid precise analysis of a two-component gas mixture in which a wide difference in the velocity of sound exists between the gases. Contract no. AF 33(038)27353.

Some applications of interferometry to precision measurement, by C. F. Bruce. Australia. Commonwealth Scientific and Industrial Research Organization. National Standards Laboratory. 1954. 20p photos, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115334

National Standards Laboratory Technical Paper no.4.
1. Interferometers, Optical - Uses - Australia 2. Interferometry - Theory - Australia 3. Interferometers - Design - Australia 4. Vibration - Measurement - Australia 5. AUS CSIR NSL TP 4.

Studies of thermal conductivity of liquids. Part III: A thermoconductimetric apparatus for liquids, by Byron C. Sakiadis and Jesse Coates. Louisiana. Engineering Experiment Station, Baton Rouge, La. 1954. 91p photos, drawings (1 fold), diagrs, graphs, tables Available from College of Engineering, Louisiana State University and Agricultural and Mechanical College, Baton Rouge 3, La. $1.00. PB 115520

1. Liquids - Heat transference 2. Liquids - Heat transference - Measuring equipment 3. L EES B 45.

LUMBER AND WOOD PRODUCTS

En transportteknisk undersøkelse pa stabeltomtene ved trelastbrukene (Investigation of methods of transport and piling adopted at saw-mills in relation to production costs). Norsk Treteknisk Institutt, Oslo, Norway. 1954. 146p photos, diagrs, graphs (1 fold), tables (Text in Norwegian) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.00, Photocopy $19.00. PB 115564

Meddelelse nr. 5. Summary, figure and table headings in English.
1. Timber - Transportation - Norway 2. Timber - Piling - Norway 3. Timber - Cost of production - Norway 4. Produksjonsteknisk Forskningsinstitutt.

Marine borer control. U. S. Naval Research Laboratory. By T. R. Sweeney, J. D. Bultman, and A. L. Alexander. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Part II: Creosote fractionation and fraction evaluation, by T. R. Sweeney, J. D. Bultman, and A. L. Alexander. Sep 1954. 28p graphs, tables Microfilm $2.25, Photocopy $4.00. PB 115476

Results of the evaluations indicated that all of the fractions tested as well as the fraction-fortified creosotes conferred resistance to borer attack on the wood; the degree of resistance was a positive function of the concentration of the preservative in the wood. NRL R 4409.

Part III: Toxin diffusion test, by T. R. Sweeney, J. D. Bultman, and A. L. Alexander. Sep 1954. 7p photo, tables Microfilm $1.50, Photocopy $1.50. PB 115477

Wood impregnated with creosote afforded little protection to adjacent untreated wood; the protection afforded by the copper-base antifouling paint was distinctly superior to that afforded by creosote. NRL R 4411.

Selected industrial films: Woodworking, a list and description of films available to business from industrial, commercial, and government sources. U. S. Office of Technical Services. Oct 1954. 8p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111388

1. Motion pictures, Educational - Bibliography 2. Woodworking industry - Motion pictures - Bibliography 3. OTS SIF 17.

MACHINERY

Case study data on productivity and factory performance: Farm implements (harrows, cultivators, plows, and mowers). U. S. Bureau of Labor Statistics. Apr 1954. 255p photos, drawings, diagrs, graphs, tables Available from U. S. Bureau of

Labor Statistics, Washington 25, D. C. PB 115404

Prepared for the Foreign Operations Administration, Industrial and Technical Assistance Division.
1. Agricultural machinery - Manufacture 2. Harrows - Manufacture 3. Cultivators - Manufacture 4. Plows - Manufacture 5. Mowers - Manufacture 6. BLS R 52.

Diffraction grating art. Progress report under Contract N6onr-243, Task order II, by John Strong. Johns Hopkins University, Baltimore, Md. Nov 1948. 48p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115266

1. Gratings, Diffraction - Manufacture 2. Films, Metallic - Ruling 3. Machines, Ruling - Design.

Evaluation of the phase converter-three-phase motor, by Kenneth A. Harkness and John W. Hooper. Kansas. Engineering Experiment Station, Manhattan, Kansas. Jul 1954. 29p diagrs, graphs, tables Available from Engineering Experiment Station, Kansas State College, Manhattan, Kans. PB 115521

Kansas State College Bulletin vol. 38, no. 11.
1. Motors, Electric - Performance 2. Frequency changers - Design 3. K EES C 8.

Hydraulic-powered platform for scaling high backs and walls, by C. K. Rose, Stephen Utter and Carl Morris. U. S. Bureau of Mines. Aug 1954. 12p photos, drawings Available from U. S. Bureau of Mines, 4800 Forbes St., Pittsburgh, Pa. PB 115330

1. Mines and mining - Wall scaling equipment 2. Platforms, Hydraulic - Design 3. Hammers, Hydraulic - Design 4. BM RI 5074.

Three-dimensional interference effects of a finite number of blades in an axial turbomachine, by Howell N. Tyson, Jr. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. Nov 1952. 23p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115326

The problem of finding the three-dimensional potential flow field for a finite number of blades of constant circulation in an axial turbomachine is reduced to the determination of the three-dimensional field due to a single radial vortex filament of uniform strength in a cylindrical annulus. The resulting solution is evaluated for the specific hub ratio of 0.6, and is compared to the two-dimensional potential flow usually assumed to exist.

MEDICAL RESEARCH AND PRACTICE

Air disinfection with ultra-violet irradiation, its effect on illness among school-children, by the Air Hygiene Committee. Gt. Brit. Medical Research Council. Air Hygiene Committee. 1954. 100p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.60. PB 115522

S. O. code no. 45-8-83.
1. Ultraviolet radiation - Bactericidal effects - Gt. Brit. 2. Ultraviolet radiation - Therapeutic use - Gt. Brit. 3. School buildings - Disinfection - Gt. Brit. 5. MRC SR 283.

Annotated bibliography of form perception, by R. B. Sleight and Grace Duvoisin. Johns Hopkins University. Aug 1952. 35p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 111516

A bibliography of forty studies, primarily of a quantitative nature, has been complied on the discriminability of geometric shapes when perceived visually. Criteria employed in the reported studies include accuracy of reports at a distance, extension of form field, and intensity threshold. These studies have been outlined according to purpose, materials and procedures, and results and conclusions. These selected studies illustrate the incompleteness of quantitative research in the field of form perception. JHU Report 166-1-153. Contract N5-ori-166, Task order I, Project no. NR-507-470.

Biological and medical aspects of ionizing radiation: Automatic sun tracking reflector as a heat source, by Robert M. Hodges, Everett O. Richey, and Oskar L. Ritter. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 5p photo, drawing, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115233

The suitability of a solar reflector for the study of flash burns is discussed. Modification of a 60-inch antiaircraft searchlight into a solar mirror is described briefly. A device for making the searchlight automatically track the sun and a high intensity heat flux meter are described in detail. AAF SAM Proj 21-3501-0005, Report no. 10.

Continuous determination of nitrogen concentrations during the respiratory cycle, by Bruno Balke. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 7p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115442

The changes in nitrogen concentration during the respiratory cycle were recorded continuously while breathing ambient air or oxygen at rest or at exercise. Breathing ambient air the tracing patterns obtained were a good indicator for the existence of a metabolic or respiratory "steady" or "unsteady state." Breathing oxygen the method permits an accurate segregation and determination of the pulmonary nitrogen elimination and the nitrogen elimi-

nation from the blood and tissue. AAF SAM Proj 21-1201-0014, Report no. 5.

Effect of heat on the regulation of body fluids and electrolytes in dogs, by G. S. Kanter. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jul 1954. 9p diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115295

Exposure of dogs to air temperatures of 44° to 48°C. for 3 to 4 hours caused, after an initial increase, a fall in both output and concentration of urinary sodium and chloride and a marked increase in potassium excretion. Final U/P ratios for sodium and chloride did not exceed 1, while the final U/P ratio for potassium exceeded 100. Contract no. AF 18(600)-612. AAF SAM Proj 21-1202-0002, Report no. 1.

Effect of various durations of red adaptation on the course of subsequent dark adaptation, by Milton S. Katz, Ailene Morris, and Forrest L. Dimmick. U. S. Navy. Medical Research Laboratory, Naval Submarine Base, New London, Conn. Apr 1954. 13p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115349

The experimental data reported pertain to the optimal duration of red light, the conditions under which it may be preferable to darkness, and the ensuing changes in dark adaptation. Bureau of Medicine and Surgery, Navy Department, Project NM 003 041.58. 01, Medical Research Laboratory, Report no. 246, Vol. XIII, no. 7. NAV MRL 246.

Effects of drugs upon the components of hand steadiness, by George T. Hauty. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 9p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115444

66 subjects were tested at 1-hour intervals following the administration of differing dosages of analeptic and depressant drugs. The analeptic increased fine tremor but did not significantly affect coarse termor whereas the effects of the cerebral depressant were to reduce and increase fine and coarse tremor, respectively. AAF SAM Proj 21-1601-0004, Report no. 5.

Electronic configuration of antibodies. Annual progress report, Jan 1, 1953 to Dec 31, 1953, under Contract Nonr 49201, by William C. Boyd, Burnett M. Pitt, Elizabeth Shapleigh. Boston University. School of Medicine, Boston, Mass. Dec 1953. 8p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115244

1. Antibodies - Effects of radiation 2. Erythrocytes - Agglutination.

Human tolerance to acute exposure to carbon dioxide: Respiratory response to oxygen and 4.1 and 6.2 percent carbon dioxide in air and oxygen at a ground level of 5,000 feet, by Nils P. V. Lundgren, Elizabeth Roorbach, Astrid Lindholm, Donald Hudson, Walter M. Boothby, and Calyton S. White. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jul 1954. 15p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115448

Subjects acclimatized to a ground level of 5,000 feet showed a transient decrease in expiratory minute volume and a temporary elevation of the alveolar pCO_2 after shifting from air to oxygen breathing. The results were discussed and were not inconsistent with the hypothesis that an acidosis increased the sensitivity of the respiratory mechanism to hypoxia. Contract no. AF 33(038)-13244. AAF SAM Proj 21-1402-0001, Report no. 2.

In vitro effectiveness of various compounds against Coccidioides immitis, by Herman I. Chinn, Roland B. Mitchell, Frederick W. Bieberdorf, and Anna C. Arnold. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 6p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115450

Stilbamidine was the most effective of all agents tested. It inhibited growth completely in each strain in concentrations of 0.001M or less. Wellcome preparations 48-166 and 48-239, Parke-Davis CMA 37, Lilly 01780, thorazine, pyrrolidinoproprionyl phenothiazine, and pentochlorophenyl cellosolve all gave complete inhibition between 0.001 and 0.01M. Ethyl vanillate and isonicotinic hydrazide and their respective derivatives were relatively ineffective. AAF SAM Proj 21-1208-0009, Report no. 2.

Loudness of speaking: The effect of the intensity of side-tone upon the intensity of the speaker, by Charles Lightfoot and Scott N. Morrill. U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla. Sep 1949. 13p diagrs, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115196

Joint project report no. 4 with Kenyon College of Gambier, Ohio, under Contract N7onr-411, T. O. I, Project no. NR 782 004.
1. Speech - Intelligibility - Effects of side-tone
2. Speech - Intensity - Effects of side-tone
3. Speech - Intelligibility - Tests 4. NMRI Proj NM 001 053, Report no. 4.

Measurement of physiological dead space and alveolar ventilation with rapid CO_2, and flow analysis, by E. S. Brown. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Apr 1954. 16p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115446

Quantitative determinations of the functional components of ventilation were made by means of simultaneous CO_2 and flow measurements. The dead space in adult subjects was of the order of 100 to 125 cc. during quiet breathing. Maximal dead space values, observed with large tidal volumes and maximal lung volume, did not exceed 250 cc. An additional variable was found to be the fraction of lung effectively ventilated. There is evidence that the cardiac contraction contributes appreciably to alveolar ventilation. Contract no. AF 18(600)-108. AAF SAM Proj, Unnumbered report.

Mechanisms of altitude adaptation: Comparative study of hypoxia and physical exercise in intact-adrenalectomized parabiotic rats, by Bernhard Hoelscher. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 7p diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115447

The underlying cause of death of the unexposed adrenalectomized partners is discussed on the basis of the existence of a parabiotic barrier for adrenal steroids. AAF SAM Proj 21-1201-0001, Report no. 6.

Permissible level of carbon monoxide in inspired air, by Christian J. Lambertsen and Willard Bascom. California. University. Scripps Institution of Oceanography. Dec 1953. 10p graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111515

1. Atmosphere - Carbon monoxide content 2. Carbon monoxide - Permissible limits 3. UC SIO Ref 54-3.

Separation of protein fractions from human plasma with ether, by R. A. Kekwick and Margaret E. Mackay. Gt. Brit. Medical Research Council. 1954. 85p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 115523

1. Blood plasma - Protein - Fractionation - Gt. Brit. 2. Ether - Uses - Gt. Brit. 3. MRC SR 286.

Studies in Air Force recruits of the effects of orally administered penicillin upon Group A streptococci by Stanley H. Gernstein, Harry A. Feldman, O. F. Harper, Jr., W. H. Klingensmith, Jerome A. Cantor. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 10p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115445

A recruit population having a high incidence of streptococcal disease was divided into test and control groups, physically separated, but otherwise comparable. Oral penicillin, 250,000 units twice daily for 10 days, was administered to one group; the streptococcal disease rate for this group promptly declined from 17/1,000/week to 2/1,000/week, and remained low for 6 weeks, while the rate for the control group remained elevated. Sensitivity reactions to oral penicillin were infrequent (0.3 percent) and mild. AAF SAM Proj 21-1401-0012, Report no. 1.

METALS AND METAL PRODUCTS

Aluminum titanate and related compounds, by N. R. Thielke. Pennsylvania State College. School of Mineral Industries. Jun 1953. 41p photos, drawing, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.50. PB 111440

The preparation of aluminum titanate and its structural, thermal and mechanical properties were investigated. Contract no. AF (616)-139, RDO no. 615-17. AAF WADC TR 53-165.

Constitution of titanium alloy systems, by Max Hansen, Donald J. McPherson, William Rostoker. Armour Research Foundation, Chicago, Ill. Feb 1953. 26p diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $8.00. PB 111508

Contract AF 33(038)-16347.
1. Phase diagrams 2. Alloys, Binary - Equilibrium diagrams 3. Titanium alloys - Crystal structure 4. Titanium alloys - Equilibrium diagrams 5. AAF WADC TR 53-41.

Corrosion problems and prevention in the chemical and petro-chemical industries in the U. S. A. Organisation for European Economic Cooperation, Paris. Aug 1954. 119p photos, diagrs, tables Available from Organisation for European Economic Cooperation, Publications Office, 2002 P St., N. W., Washington 6, D. C. $1.50. PB 115336

Technical assistance mission no. 130.
1. Corrosion - Prevention 2. Corrosion - Testing equipment 3. Materials - Corrosion prevention 4. Petroleum industry - Corrosion prevention 5. Chemical industry - Corrosion prevention 6. OEEC TAR/130(54)1.

Diffusion of cobalt and nickel into titanium carbide. New York State College of Ceramics, Alfred, N. Y. Under Contract no. AF 33(038)-16190, by Robert C. Turnbull and W. G. Lawrence. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Letter report no. 2. Mar 1951. 4p Microfilm $1.50, Photocopy $1.50. PB 115246

Fundamental theory of diffusion as applied to this problem is described. Three samples were fired in a helium atmosphere in a platinum wound tube furnace. Thin slabs were cut from

each sample and the diffusion results qualitatively determined on photographic plates.

Letter report no. 3. May 1951. 5p graph Microfilm $1.50, Photocopy $1.50. PB 115247

Qualitative evidence indicates that surface diffusion is much greater than bulk diffusion. A process is under development to measure this quantity. A method of grinding away the active face and counting the activity is presented together with the mathematical analysis.

Letter report no. 4. Sep 1951. 6p. Microfilm $1.50, Photocopy $1.50. PB 115351

Methods are described for the measurement of surface diffusion as well as bulk diffusion. The surface diffusion is measured by the autoradiographic technique while the bulk diffusion is determined by a grinding and counting procedure.

Letter report no. 5. Jan 1952. 11p diagrs Microfilm $2.00, Photocopy $2.75. PB 115248

The purpose of this report is to describe the experimental approach to the study of reactions between metals (cobalt, iron and nickel) and titanium carbide; so that the factors which affect the diffusion of these metals into titanium carbide may be evaluated. The experiments described in this report have been designed as an aid to the investigation of the diffusion of cobalt, iron and nickel into titanium carbide by radioactive isotopes.

Letter report no. 6. Apr 1952. 7p tables Microfilm $1.50, Photocopy $1.50. PB 115249

1. Cobalt - Diffusion 2. Iron - Diffusion 3. Nickel - Diffusion 4. Titanium carbides - Reactions.

Evaluation of the bandsawing of titanium and the various alloys, by L. V. Colwell and R. E. McKee. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jun 1953. 40p photos, drawings, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 111477

Project M993. Progress report no. 11, Contract DA-20-018-ORD-11918. Project no. TB4-15.
1. Titanium - Machinability 2. Titanium alloys - Machinability 3. Tools, Cutting - Life expectancy 4. WAL R 401/109-11.

Experimental and theoretical investigation of the anisotropy of 3S aluminum-alloy sheet in the plastic range, by Arthur J. McEvily, Jr. and Philip J. Hughes. U. S. National Advisory Committee for Aeronautics. Oct 1954. 45p photos, drawings, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115487

The results of tension and compression tests on 3S aluminum-alloy sheet are presented together with values of Poisson's ratio in the plastic range. X-ray diffraction studies of annealed specimens were made and pole figures showing the type of preferred orientation were drawn. A theoretical analysis was made to account for the observed anisotropy based on the behavior of single crystals and the texture of the sheet. NACA TN 3248.

Face milling titanium. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Under Contract no. DA-20-018-ORD-11918. Project M993. Order separate parts described below from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C., giving PB number of each part ordered.

Report no. 23A: Comparison with previous tests, by W. W. Gilbert and C. H. Good. Jul 1953. 16p photos, diagrs, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111494

This report compares the results of tool-life cutting-speed tests when face milling titanium alloys Ti-75A, RC-130B, Ti-150A, and Ti-150B, with previous tests on cast irons. WAL R 401/109-23A. MU ERI 23A.

Progress report no. 23C: Effect of feed, relief, side-rake, and side-cutting-edge angle on tool life, by W. W. Gilbert and C. H. Good. Jul 1953. 16p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111496

Low feed and larger side-cutting-edge angles improved tool life by reducing chipping. Relief angles had no major effect. Optimum rake angle was dependent upon grade of carbide. MU ERI 23C. WAL R 401/109-23C.

Investigation and evaluation of new high temperature materials. American Electro Metal Corporation, Yonkers, N. Y. Under Contract no. AF 33(616)-109. Project no. 52-670A-83. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Progress report no. 1, May 1, 1952 to July 31, 1952, by W. Arbeiter, Paul Schwarzkopf, and W. Leszynski. Jul 1952. 62p photo, graphs, tables (part fold) Microfilm $3.25, Photocopy $9.00. PB 115415

Part II is original English version of paper delivered in German at Symposium on the Reactivity of Solids, Gothenburg, Sweden, June 10, 1952. Appendix I: Chart I: Systematic arrangement of binary compounds. Chart II: Systems with compounds of known melting point over 1500°C. - Appendix II: Bibliography. - Appendix III: Index to bibliography.
1. Materials, Heat resistant - Properties
2. Alloys, Binary - Equilibrium diagrams
3. Alloys, High temperature - Crystal structure
4. Alloys, High temperature - Melting point
5. Solid solutions - Thermal properties.

Progress report no. 2, Aug 1 1952 to Oct 31, 1952, by W. Arbeiter and R. Bizzard. Oct 1952. 13p drawing, tables Microfilm $2.00, Photocopy $2.75. PB 115416

Binary intermetallic compounds in several systems involving transition metals were prepared and tested. Of the compositions tested, only Cr_2Ti showed good oxidation resistance at 1000°C. Additional physical measurements were made and are tabulated.

Progress report no. 3, Nov 1, 1952-Feb 1, 1953, by W. Arbeiter, I. Walton and R. Bizzard. Mar 1953. 28p photos, graphs, table Microfilm $2.25, Photocopy $4.00. PB 115417

Several methods of preparing selected intermetallic compounds have been studied and the resulting materials evaluated particularly with respect to oxidation resistance. Other pertinent information concerning these materials is included and discussed.

Progress report no. 4, May 1, 1953 to July 31, 1953, by W. Arbeiter, I. Binder, I. Walton and R. Bizzard. Jul 1953. 23p tables Microfilm $2.25, Photocopy $4.00. PB 115418

Some of the properties of chromium-titanium and chromium-silicon compositions are tabulated. In addition, the procedures followed in the preparation of these materials and in the fabrication of test specimens are outlined.

Progress report no. 5, Nov 1, 1953 to Feb 28, 1954, by William Arbeiter, I. Binder, K. Langrod, and R. Bizzer. Feb 1954. 44p photos, diagrs, graphs, tables Microfilm $2.75, Photocopy $6.50. PB 115421

A large number of compositions have been prepared in the chromium-titanium-oxygen system and these, together with many formerly reported, have been treated on the basis of the ternary system Cr-Ti-O and equilibrium phases for these compositions have been calculated on the basis of chemical analysis. Average properties of hot pressed compositions are given for most of these materials and in some cases the average properties of sintered compositions are also given.

Technical report no. 1, May 1, 1952-Apr 30, 1953, by W. Arbeiter, I. Walton and R. Bizzard. Apr 1953. 92p photo, drawings, diagrs, graphs, tables Microfilm $4.50, Photocopy $12.75. PB 115419

The details of the preparation and the testing of intermetallic compounds are reported. A composition whose starting components were 95% Cr_2Ti and 5% Cr_2O3 has shown promising high temperature properties, including good oxidation resistance and high stress-to-rupture strength. Additional compositions have been tested and several appear to be of interest.

Investigation of the electromagnetic properties of some metallic sulfides at very high frequencies, by J. P. Stone, A. G. Sands, and M. V. McDowell. U. S. Naval Research Laboratory. Sep 1954. 14p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115474

The magnetic permeability and dielectric constant of a number of prepared metallic sulfides were determined at frequencies approaching 10,000 Mc in an effort to find materials with a ratio of magnetic permeability to dielectric constant near unity in this frequency range. NRL R 4408.

Metal processes and apparatus, machinery, and transportation equipment: Government-owned inventions available for license. U. S. Government Patents Board. Oct 1954. 61p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.00. PB 111467

1. Metals - Production - Patents 2. Machinery - Patents 3. Transporation equipment - Patents 4. GPB PA 4.

Power required to face mill titanium, by W. W. Gilbert. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jul 1953. 12p photo, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111498

Equations are given for computing the horsepower at the cutter and the horsepower to the motor when face milling each of the titaniums Ti-75A, RC-130B, and Ti-150A and SAE 1045 steel. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 23E. WAL R 401/109-23E.

Recrystallization and melting of simple crystals. Reports no. 36-38 under Contract no. N6onr 269, Task order 8, NR 032-264 and NR 032-265. Pennsylvania State College. School of Mineral Industries, State College, Pa. Aug 1951. 74p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115264

Contents: Report no. 36. Mechanism of recrystallization and of sintering, by W. A. Weyl and D. P. Enright. - Report no. 37. Atomistic approach to the melting of simple ionic crystals, by W. A. Weyl. - Report no. 38. Atomistic approach to the formation of eutectics between simple binary compounds, by W. A. Weyl.
1. PSC SMI TR 36 2. PSC SMI TR 37 3. PSC SMI TR 38.

Research and development of methods of chemical analysis for titanium metal and alloys. Final technical report under Contract no. DA-30-069-ORD-1114, by Henry Suss, Gregory Pantchenko, and Anna Aronson. Tour, Sam, & Co., Inc., New York, N. Y. May 1954. 136p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photocopy $17.75. PB 115335

Various commercial methods of chemical analysis of titanium and its compounds for aluminum molybdenum, carbon, chromium, manganese, vanadium, columbium, tantalum, tungsten, iron, nitrogen, magnesium, silicon, chlorides, tin, boron, and other elements are evaluated. Report no. 10780. RAD no. ORDTB 2-1065. RAD Project no. TB4-15C. WAL R 401/48/A-36.

METEOROLOGY AND CLIMATOLOGY

Analysis of radar ice reports submitted by Hudson Bay shipping (1953), by A. D. Hood. National Research Council of Canada. Radio and Electrical Engineering Division. May 1954. 7p map, graph, tables Available from National Research Council of Canada, Ottawa, Canada. $.10. PB 115291

1. Ice formation - Radar detection - Canada 2. Radar - Arctic regions - Canada 3. NRCC ERB-330 4. NRCC 3301.

Analysis of zodiacal light recordings obtained at Capillo Peak observatory, by Victor H. Regener. New Mexico. University. Dept. of Physics, Albuquerque, N. Mex. Jun 1954. 58p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115206

Scientific report no. 3. Contract no. AF 19(604)-181.
1. Zodical light - Spectrographic analysis 2. Projectors - Design.

Atmospheric ozone. Final report under Contract no. AF 19(122)-381, by Victor H. Regener. New Mexico. University. Dept. of Physics, Albuquerque, N. Mex. Aug 1954. 16p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115462

Gives a summary of the five Scientific Reports which were issued at the end of the contract and which contain a full and final account of the work performed and of the results obtained. The general significance of the results is discussed. Summary of Scientific reports 1-5.

Atmospheric ozone in the boundary layer, by Victor H. Regener. New Mexico. University. Dept. of Physics, Albuquerque, N. Mex. Aug 1954. 40p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115460

Scientific report no. 4 under Contract no. AF 19(122)-381.
1. Atmosphere - Ozone - Determination 2. Ozone - Measuring equipment.

Atmospheric ozone in the Los Angeles region, by Victor H. Regener. New Mexico. University. Dept. of Physics, Albuquerque, N. Mex. Jul 1954. 47p maps, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115500

Contract no. AF 19(122)-381. Scientific report no. 3.
1. Atmosphere - Ozone - Measurement.

AWS sferics evaluation project (1951). Final report. U. S. Air Force. Air Weather Service, Andrews Air Force Base, Washington, D. C. Aug 1954. 155p photos, maps, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.25, Photocopy $20.25. PB 115496

1. Sferics - Meteorological evaluation 2. Thunderstorms - Electrical properties 3. Atmosphere - Electromagnetic disturbances 4. Weather forecasting, Short range - Methods 5. AAF AWS TR 105-102.

Circulation of the atmosphere in the Central Polar basin, 1941-1945, by B. L. Dzerdzeevskii. Translated by Curtis D. Benster. Jun 1954. 226p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $8.25, Photocopy $29.00. PB 115492

University of California. Dept. of Meteorology. Scientific report no. 6. Contract AF 19(122)-228. Vol. 2, Part 3, chapters 1-7 of Trudy dreifuiushchei stantsii "Severnyi Polius," (Reports of the drifting station "North Pole").
1. Meteorology - Observations - Arctic regions 2. Arctic regions - Climate 3. "North Pole" (Meteorological drifting station) 4. Atmosphere - Pressure - Distribution - Arctic.

Direct spectrographic measurement of atmospheric ozone concentrations, by Victor H. Regener. New Mexico. University. Dept. of Physics, Albuquerque, N. Mex. Jun 1954. 43p photos, diagrs, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115235

This report deals with spectrographic methods which were used on several occasions for the direct measurement of atmospheric ozone concentrations. Contract no. AF 19(122)-381 (Continuation of Contract W28(099)ac-379).

Dropsonde record from Alaska to the North Pole, Apr 1950-Apr 1952, by W. C. Poage, Jr. California. University. Dept. of Meteorology, Los Angeles, Calif. Jun 1954. 72p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115489

Scientific report no. 2. Contract AF 19(122)-228.
1. Soundings, Meteorological 2. Atmosphere, Upper - Temperature - Measurements 3. Radiosondes - Meteorological records 4. Meteorology - Observations - Alaska 5. Meterology - Observations - North Pole 6. Arctic regions - Climate.

Effect of plate threshold on apparent intensities of coronal lines, by Harold Glazer and Barbara Bell. Harvard University. Harvard College Observatory. Solar Dept. Jul 1954. 16p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115498

Contract AF 19(604)-146. Scientific report no. 18.
1. Corona discharges - Measurement 2. Coronagraphs - Effect of sky light 3. Corona discharges - Intensity - Theory 4. HU HCO SR 18.

Installation at Capillo Peak for the recording of the zodiacal light, by Victor H. Regener. New Mexico. University. Dept. of Physics, Albuquerque, N. Mex. Jun 1954. 46p photo, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115205

Scientific report no. 2. Contract no. AF 19(604)-181.
1. Zodiacal light - Photometric measurement
2. Zodiacal light - Polarization - Measurement
3. Solar observatories - Equipment.

Investigation of relationships between northern and southern hemisphere meteorological parameters, by Morton J. Rubin. Weather Services, Inc., Boston, Mass. 1953? 24p map, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115456

Scientific report no. 4. Contract no. AF 19(604)-449.
1. Atmosphere - Circulation.

Investigation of the ice fog phenomena in the Alaskan area. Report no. 15 (final report) covering the period 1 Feb 1953-28 Feb 1954, under Contract no. AF 19(122)-634, by Elmer Robinson. Stanford Research Institute, Stanford, Calif. May 1954. 71p photos, drawings, diagrs, graphs, map, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115471

1. Fog, Ice - Research - Alaska 2. Humidity - Measurements - Alaska 3. Light - Scattering - Measurements - Alaska 4. Light - Scattering - Measuring equipment 5. Atmosphere - Temperature - Measurement - Alaska 6. Instruments, Meteorological - Design 7. Cameras, Aerosol - Design 8. Transmissometers - Design 9. SRI Proj no. CU-473, Report no. 15.

Mean geostrophic poleward flux of angular momentum and of sensible heat in the winter and summer of 1949, by Yale Mintz. California. University. Dept. of Meteorology, Los Angeles, Calif. Jul 1954. 14p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115459

Scientific report no. 7 under Contract no. AF 19-(122)-48.
1. Atmosphere - Angular momentum 2. Atmosphere - Heat transference - Measurement.

On total momentum vorticity with application to the study of the general circulation of the atmosphere, by Shih-Kung Kao. California. University. Dept. of Meteorology, Los Angeles, Calif. Feb 1953. 81p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115458

Scientific report no. 1 under Contract AF 19(122)-48.
1. Atmosphere - Circulation 2. Winds, Gesotrophic - Measurement 3. Vortex motion - Theory.

Photochemistry of oxygen, by Marcel Nicolet. Pennsylvania State University. Ionosphere Research Laboratory, State College, Pa. Apr 1954. 69p graphs, tables Available from Cffice of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.25. PB 111513

The aeronomic problem of the dissociation of oxygen is studied quantitatively in the mesophere and thermosphere. The rate coefficients for various reactions are calculated, and concentrations of ozone, molecular and atomic oxygen are deduced. The way in which departures from photochemical conditions may behave and the differences between day and night time conditions are described. Contract no. AF 19(122)-44. PSC IRL SR 61.

Presentation of data obtained at the Great Plains field test, O'Neill, Nebraska, Aug-Sep 1953, by Robert M. Stewart, Jr. Iowa State College. Dept. of Physics, Ames, Iowa. Jul 1954. 52p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115457

Scientific report no. 5. Contract no. AF 19(122)-440.
1. Atmosphere - Temperature - Tables 2. Winds - Velocities - Measurement.

Probable ice island locations in the Arctic basin, Jan 1954, by A. P. Crary and Irene Browne. U. S. Air Force. Air Research and Development Command. Cambridge Research Center. Geophysics Research Directorate, Cambridge, Mass. May 1954. 23p maps, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115414

1. Ice - Motion - Arctic Ocean 2. Currents, Ocean - Velocity - Measurement - Arctic Ocean 3. Winds, Geostrophic - Arctic Ocean 4. AAF GRD SG 50 5. AAF CRC TR 54-10.

Quarterly summary of observations made at Seabrook, N. J., Oct 1, 1953 to Dec 31, 1953, edited

by C. W. Thornthwaite, M. H. Halstead, J. R. Mather. Johns Hopkins University. Laboratory of Climatology, Seabrook, N. J. 1953. 46p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115213

Publications in climatology, vol. VI, no. 7. Contract AF 19(604)-289.
1. Micrometeorology 2. Evapotranspiration 3. Soils - Temperature - Measurement.

Recordings of surface ozone in New Mexico, by Victor H. Regener. New Mexico. University. Dept. of Physics, Albuquerque, N. Mex. Aug 1954. 109p map, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photocopy $14.00. PB 115461

Scientific report no. 5 under Contract no. AF19(122)381.
1. Atmosphere - Ozone - Determination 2. Atmosphere - Circulation - Troposphere.

Reports of the drifting station North Pole, translated abstracts, Vol. I, Parts 1-5, Vol. II, Parts 1-2. California. University. Dept. of Meteorology, Los Angeles, Calif. Jun 1954. 76p drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115491

Scientific report no. 5. Contract AF 19(122)-228. For translation of vol. II, pt. 3 see PB 115492. Catalogued by the Library of Congress as "Ekspeditsiia SSSR na Severnyi Polius". Contents: Vol. I, Part 1: Expedition to the Pole, by O. Iu. Shmidt. - Part 2: The drifting station, by I. D. Papanin. - Part 3: The flight, by M. I. Shevelev. - Part 4: Radio station "Upola," by E. T. Krenkel. - Part 5: Astronomical computations, by E. K. Fedorov. - Vol. II, Part 1: Meteorological instruments and observations, by E. K. Fedorov. - Part 2: Meteorological service of the expedition, by D. L. Dzerdzeevskii.

Review of radiation scattering methods for measuring cloud droplet size, by D. C. Baxter. National Research Council of Canada. Division of Mechanical Engineering. Low Temperature Laboratory. Apr 1954. 38p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. Available for exchange from Division of Mechanical Engineering, National Research Council of Canada, Montreal Road, Ottawa, Canada. PB 115259

The fundamental aspects of radiation scattering from spherical particles are reviewed and used as a background for the study of various systems for the measurement of particle size in natural clouds, a parameter of interest in cloud physics and aircraft icing work. Corona, rainbow and polarization methods are discussed. NRCC ME MD-40.

Studies of the atmospheric general circulation. Final report, part 1, under Contract no. AF 19-122-153, by Victor P. Starr. Massachusetts Institute of Technology. Dept. of Meteorology. May 1954. 541p photos, diagrs, maps, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.25, Photocopy $69.00. PB 115402

Includes articles reprinted from various periodicals.
1. Atmosphere - Circulation 2. Atmosphere - Angular momentum 3. Atmosphere - Energy 4. Flow, Baroclinic 5. Flow, Barotropic 6. Winds, Geostropic.

Study of atmospheric temperature and meteoric content by ultrasonic techniques and development of special microphones. Final report under Contract no. AF 19(604)-284, by J. Lloyd Bohn. Temple University. Research Institute, Philadelphia, Pa. 1953. 19p drawings, fold diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115212

This report gives a brief description of microphones used in making measurements on high intensity radiation. Complete drawings are given for the entire assembly, including the teflon carriage, which fits into the glass envelope. Reasons for the desirability of a six-channel recorder, together with a complete schematic of such a recorder, are included. Also given, are brief descriptions of amplifiers and of FM in general.

Summary of ice island "T-3" upper air temperature data, 1952-53, and comparison with other polar station data, by A. D. Belmont. California. University. Dept. of Meteorology, Los Angeles, Calif. Jun 1954. 71p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115561

Contract AF 19(122)-228. Scientific report no. 4.
1. Atmosphere, Upper - Temperature - Measurement 2. Meteorological stations - Arctic Ocean.

Translations of papers by B. L. Dzerdzeevskii. I: On the distribution of atmospheric pressure over the central Arctic. II: The circulation model in the troposphere of the central Arctic. California. University. Dept. of Meteorology, Los Angeles, Calif. Jun 1954. 72p diagrs, maps, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115490

Scientific report no. 3. Contract no. AF 19(122)-228. The first paper was translated from Meteorologiia i Gidrologiia no. 1, pp. 33-38, 1946.
1. Atmosphere - Pressure - Arctic regions 2. Atmosphere - Temperature - Arctic regions 3. Arctic regions - Climate 4. Meteorology - Observations - Russia 5. Troposphere - Pressure - Russia 6. Troposphere - Temperature - Russia 7. Cyclones, Tropospheric - Russia 8. Isobars - Arctic regions.

MINERALS AND MINERAL PRODUCTS

Ceramic-lined rocket motors for service tests. 1st quarterly report under Contract no. AF 33(038)-841, for the period May 12, 1949 to August 15, 1949, by J. M. Lepp, J. F. Lynch, J. A. Slyh, W. H. Duckworth, and H. Z. Schofield. Battelle Memorial Institute, Columbus, Ohio. Aug 1949. 11p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115362

Details are given on the development of ceramic liners and nozzles for rocket thrust cylinders submitted for static rocket firing tests. Of eight liners submitted to Wright-Patterson Air Force Base, five were prepared of magnesia, two of zirconia, and one of hydromite. Variations of thickness of the combustion chamber liners, nozzles, and insulating material are outlined for this series. All assemblies were designed to produce a thrust of about 1000 pounds. A table is presented reviewing the installation of each assembly and covering composition and thickness of each. AAF TR 6052. BMI 69.

Ceramic materials of construction for rocket motors. Battelle Memorial Institute, Columbus, Ohio. Under Contract AF 33(038)-841. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Monthly report for the period of 12 May 1949 to 15 June 1949, by J. M. Lepp, J. F. Lynch, J. A. Slyh, W. H. Duckworth and H. Z. Schofield. Jun 1949. 6p Microfilm $1.50, Photocopy $1.50. PB 115360

1. Rocket motors - Ceramic components 2. BMI 67.

Monthly report for the period of June 15, 1949 to July 15, 1949, by J. M. Lepp, J. F. Lynch, J. A. Slyh, W. H. Duckworth and H. Z. Schofield. Jul 1949. 7p Microfilm $1.50, Photocopy $1.50. PB 115361

1. Rocket motors - Ceramic components 2. Graphite - Extrusion 3. Zirconium oxide - Thermal properties 4. Magnesia - Grain size - Distribution 5. Refractory materials - Thermal properties 6. BMI 68.

Monthly report for the period of Aug 15, 1959 to Sep 15, 1949, by J. M. Lepp, J. F. Lynch, J. A. Slyh, W. H. Duckworth and H. Z. Schofield. Sep 1949. 8p Microfilm $1.50, Photocopy $1.50. PB 115363

1. Rocket motors - Ceramic components 2. Magnesia - Thermal properties 3. Magnesia - Grain size - Distribution 4. Graphite - Coatings, Silicon carbide 5. Graphite - Coatings, Titanium carbide 6. BMI 70.

Monthly report for the period of Nov 15, 1949 to Dec 15, 1949, by J. M. Lepp, J. F. Lynch, J. A. Slyh, W. H. Duckworth, and H. Z. Schofield. Dec 1949. 7p Microfilm $1.50, Photocopy $1.50. PB 115365

1. Rocket motors - Liners - Insulating materials 2. Rocket motors - Ceramic components 3. Graphite - Coatings, Molybdenum disilicide 4. Ceramic materials - Porosity 5. Ceramic materials - Coatings, Metallic - Electrode position 6. AAF TR 6086 7. BMI 74.

Monthly report for the period of Dec 15, 1949 to Jan 15, 1950, by J. F. Lynch, D. W. Kocher, J. A. Slyh, W. H. Duckworth, and H. Z. Schofield. Jan 1950. 4p Microfilm $1.50, Photocopy $1.50. PB 115366

1. Rocket motors - Ceramic components 2. Graphite - Coatings, Ceramic - Heat resistance 3. Graphite - Coatings, Molybdenum disilicide - Thermal properties 4. BMI 75.

Monthly report for the period of Jan 15, 1950 to Feb 15, 1950, by J. F. Lynch, D. W. Kocher, J. A. Slyh, W. H. Duckworth, and H. Z. Schofield. Feb 1950. 4p Microfilm $1.50, Photocopy $1.50. PB 115367

1. Rocket motors - Ceramic components 2. Graphite - Coatings, Molybdenum disilicide 3. BMI 76.

Monthly report for the period of Feb 15, 1950 to Mar 15, 1950, by J. F. Lynch, D. W. Kocher, J. A. Slyh, W. H. Duckworth, and H. Z. Schofield. Mar 1950. 5p Microfilm $1.50, Photocopy $1.50. PB 115368

1. Rocket motors - Ceramic components 2. Graphite - Coatings, Molybdenum disilicide 3. Rocket motors - Liners - Insulating materials 4. BMI 77.

Monthly report for the period of Mar 15 to Apr 15, 1950, by J. F. Lynch, D. W. Kocher, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Apr 1950. 6p Microfilm $1.50, Photocopy $1.50. PB 115369

1. Rocket motors - Ceramic components 2. Rocket motors - Nozzles - Materials 3. Graphite - Coatings, Molybdenum disilicide 4. Rocket motors - Liners - Insulating materials 5. BMI 78.

Monthly report for period Apr 15, 1950 to May 15, 1950, by J. F. Lynch, D. W. Kocher, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. May 1950. 10p table Microfilm $1.50, Photocopy $1.50. PB 115370

Report no. 79.
1. Rocket motors - Materials 2. Graphite - Coatings, Silicon carbide 3. Coatings, Molybdenum disilicide - Thermal properties.

Monthly report for period May 15, 1950 to Jun 15, 1950, by J. F. Lynch, D. W. Kocher, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Jun 1950. 7p Microfilm $1.50, Photocopy $1.50.
PB 115371

Report no. 80.
1. Rocket motors - Materials 2. Coatings, Molybdenum disilicide - Thermal properties 3. Graphite - Coatings, Silicon carbide.

Monthly report for period Jun 15, 1950 to Jul 15, 1950, by J. F. Lynch, D. W. Kocher, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Jul 1950. 7p Microfilm $1.50, Photocopy $1.50.
PB 115372

Report no. 81.
1. Rockets motors - Materials 2. Coatings, Molybdenum disilicide - Thermal properties 3. Graphite - Coatings, Silicon carbide.

Monthly report for period Jul 15, 1950 to Aug 15, 1950, by J. F. Lynch, D. W. Kocher, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Aug 1950. 7p Microfilm $1.50, Photocopy $1.50.
PB 115373

Report no. 82.
1. Rocket motors - Materials 2. Graphite - Coatings, Silicon carbide.

Monthly report for period Aug 15, 1950 to Sep 15, 1950, by J. F. Lynch, D. W. Kocher, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Sep 1950. 7p Microfilm $1.50, Photocopy $1.50.
PB 115374

Report no. 83.
1. Rocket motors - Materials 2. Hydrocal (Trade name) 3. Graphite - Coatings, Titanium-silicon.

Monthly report for period Sep 15, 1950 to Oct 15, 1950, by J. F. Lynch, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Oct 1950. 8p Microfilm $1.50, Photocopy $1.50. PB 115375

Report no. 84.
1. Rocket motors - Materials 2. Graphite - Coatings, Oxidation prevention 3. Calcium - Thermal properties 4. Magnesia - Thermal properties.

Monthly report for period Nov 15, 1950 to Dec 15, 1950, by J. F. Lynch, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Dec 1950. 5p Microfilm $1.50, Photocopy $1.50. PB 115376

Report no. 86.
1. Rocket motors - Materials 2. Rocket motors - Nozzles - Materials 3. Rocket motors - Liners - Insulating materials.

Monthly report for period Jul 15 to Aug 15, 1951, by J. F. Lynch, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Aug 1951. 8p Microfilm $1.50, Photocopy $1.50. PB 115377

Report no. 94.
1. Rocket motors - Materials 2. Rocket motors - Liners - Insulating materials 3. Graphite - Coatings, Molybdenum disilicide.

Monthly report for period Aug 15 to Sep 15, 1951, by J. F. Lynch, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Sep 1951. 6p Microfilm $1.50, Photocopy $1.50. PB 115378

Report no. 95.
1. Rocket motors - Materials 2. Graphite - Coatings, Molybdenum disilicide 3. Alfrax (Trade name) 4. Rocket motors - Liners - Insulating materials.

Monthly report for period Sep 15, 1951 to Oct 15, 1951, by J. T. Lynch, W. H. Duckworth, J. A. Slyh, and H. Z. Schofield. Oct 1951. 5p Microfilm $1.50, Photocopy $1.50. PB 115379

Report no. 96.
1. Rocket motors - Materials 2. Alfrax (Trade name) 3. Rocket motors - Liners - Insulating materials 4. Graphite - Coatings, Molybdenum disilicide.

Developmental tests of fiberglas-reinforced plastic pressure vessels for flame throwers, by Robert F. Nordhoff and Irving S. Sherman. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Aug 1954. 49p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115299

Aiming toward the development of a lightweight flame thrower an investigation and evaluation of reinforced plastic pressure vessles submitted for consideration were conducted. Attempts were made to develop test procedures for evaluating prototype flame thrower pressure vessels. Plastic compared most favorably with steel. Project 4-09-02-018. CC CRL R 356.

Provning av vattententäthet hos betong med prismaformade provkroppar (Permeability test on concrete using prismatic specimens), by Per Nycander. Sweden. Statens Provningsanstalt, Stockholm. 1954. 11p photos, graphs, table (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75.
PB 115398

Summary in English.
1. Concrete - Penetration tests - Sweden 2. Sweden. Statens Provningsanstalt, Stockholm. Meddelande 112.

Research investigation on properties and behavior of quartz and glass elastic pressure elements. Summary report under Contract no. DA-36-039-sc-5430, by H. Heckscher and H. J. Grover.

Battelle Memorial Institute, Columbus, Ohio. Apr 1953. 57p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115451

This report summarizes the results of an investigation of the behavior and properties of quartz and of glass elastic pressure-sensitive elements.

Simulated rocket-service tests on commercial refractories. Quarterly report under Contract no. AF 33(038)-841, by J. M. Lepp, J. F. Lynch, J. A. Slyh, W. H. Duckworth, and H. Z. Schofield. Battelle Memorial Institute, Columbus, Ohio. Nov 1949. 16p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115364

The resistance to erosion, spalling, cracking, fusion, etc. of several commercially available refractory materials, when subjected to the action of a hot gas stream under controlled conditions, is discussed. The results of these tests are tabulated in the Appendix, along with a description of the equipment used. AAF TR 6085. BMI 73.

Study of concreting methods on housing sites, by K. G. H. Fryer and J. F. Eden. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, Eng. Jul 1954. 60p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 115544

S. O. code no. 47-550-23.
1. Concrete - Mix proportions - Gt. Brit. 2. DSIR NB SR 23.

ORDNANCE AND ACCESSORIES

Properties and tables of generalized rocket functions for use in the theory of rockets with a constant slow spin, by J. Barkley Rosser and R. J. Walker. Cornell University, Ithaca, N. Y. Apr 1953. 113p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.25. PB 115285

Contract DA 30-115-ORD-327.
1. Equations of motion 2. Ballistics, Rocket - Exterior - Tables 3. Rockets - Theory.

PACKING AND PACKAGING

Calculating cushion thickness by analysis of stress-strain curves, by R. E. Jones and D. L. Hunziker. U. S. Forest Products Laboratory, Madison, Wis. Jan 1954. 156p photos, diagrs, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $4.75. PB 111520

A method for designing package cushioning to protect an article against shock is developed from physical and mathematical concepts. Design curves for calculating cushion thickness are included for many currently available cushioning materials. Methods for selecting the proper cushion are discussed. Contract no. AF 33(038)-4065. AAF WADC TR 53-334.

Design of reclaimed latex foam package cushioning, by Roger B. Orensteen. U. S. Air Force. Air Research and Development Command. Wright Air Development Center. Materials Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jan 1954. 19p graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111518

A method of designing reclaimed latex foam cushioning from static data is presented. Design curves are provided for selecting density, thickness, and cushion area for economical cushion design. Recommended procedures are discussed for designing to optimum density, stress, and ratio/stress energy in a given situation. Third of a series of reports on package cushioning. For 1st-2d see PB 111227-111228. AAF WADC TR 53-132.

Evaluation of container-grade paper-overlaid veneer, by E. H. Clarke. U. S. Forest Products Laboratory, Madison, Wis. Jan 1954. 50p photos, graph, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.50. PB 111519

By conducting over 1,500 tests on specimens of paper-overlaid veneer and container-grade plywood along with tests of 165 containers, information was obtained that indicates a correlation exists between some of the mechanical properties of paper-overlaid veneer materials and the expected rough-handling performance of fully cleated domestic boxes using such material for panels. The results also indicate that all of the tested 19 different paper and veneer combinations, each varying from the other by differences in core, overlays, or manufacture process, are suitable alternates for 3/20-inch (Groups I and II) container-grade plywood in panel boxes. Some combinations appeared to be suitable as alternates for thicker plywood. Contract AF 33(038)-51-4065. AAF WADC TR 53-216.

PERSONNEL APTITUDE TESTING

Assimilation of visual information from linear dot patterns, by Irwin Pollack and E. T. Klemmer. U. S. Air Force. Air Research and Development Command. Cambridge Research Center. Operational Applications Laboratory, Bolling Air Force Base, Washington, D. C. Jul 1954. 14p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115203

1. Personnel, Communications - Tests 2. Visual perception - Testing equipment 3. Visual perception - Tests 4. AAF CRC TR 54-16.

Experimental comparison of 5 conditions for voice communication training, by J. C. Kelley and Harry M. Mason. Purdue University. Purdue Research Foundation. Lafayette, Ind. Aug 1947. 59p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115026

SDC Human Engineering Project 20-K-1. Contract N6ori-104, Task order no. 2, Report no. 4.
1. Speech - Intelligibility - Tests 2. Speech - Training 3. 8-I (Speech training device).

Map-using proficiency of basic trainees, by Robert B. Tallarico, William E. Montague, Victor H. Denenberg. George Washington University. Human Resources Research Office, Washington, D. C. Sep 1954. 59p photo, graphs, maps, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115478

1. Map reading - Training - Tests 2. Map reading - Training equipment 3. GWU HRRO TR 11.

Preliminary investigation of the common-core program and the learning of basic electrical theory at the Class A Electrician's Mates School, San Diego, California. Management and Marketing Research Corporation, Los Angeles, Calif. Dec 1953. 8p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 114887

Contract N8onr 70000, Task I.
1. Electricity - Theory 2. Electricians - Performance - Tests 3. Electrician's mates (EM's) batteries of practical performance tests 4. Learning - Theory.

Study of the time-dependent wind-driven ocean circulation, by G. Veronis and G. W. Morgan. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Dec 1953. 12p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.00. PB 114942

Contract N7onr-35801, T. O. I, NR-041-032.
1. Currents, Ocean - Mathematical analysis 2. Equations of motion 3. Ocean surface - Effects of wind stress 4. GDAM A11-101/110.

Transfer effects in following tracking resulting from reversal of the display-control relationship on alternate blocks of trials, by B. G. Andreas, R. F. Green, S. D. S. Spragg. Rochester. University, Rochester, N. Y. Sep 1953. 9p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115399

Contract N6onr-241, T. O. 6. Project 20-M-1d.
1. Tracking - Operator response 2. Tracking - Psychological aspects 3. Tracking equipment, Optical - Transfer effects 4. SDC TR 241-6-10.

Visual noise filtering by the human operator. II: Linear dot patterns in noise, by Irwin Pollack and E. T. Klemmer. U. S. Air Force. Air Research and Development Command. Cambridge Research Center. Operational Applications Laboratory, Bolling Air Force Base, Washington, D. C. Jul 1954. 10p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115202

1. Communications, Visual - Filtering 2. Personnel, Communications - Tests 3. Noise - Visual filtering 4. Visual perception - Testing equipment 5. AAF CRC TR 54-15.

PHYSICS

General

Analysis of the fluid flow in the spray root and wake regions of flat planing surfaces, by John D. Pierson and Samuel Leshnover. Stevens Institute of Technology. Experimental Towing Tank, Hoboken, N. J. Oct 1948. 67p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 115275

This report presents a comprehensive investigation of three types of potential fluid flow which together form the foundation for a large part of the hydrodynamic planing and impact theory advanced by Wagner. A detailed study is made of the potential flow properties of an ideal fluid whose motion over a solid boundary has the formation of a sheet of spray as its most important characteristic. The broad possibilities for applying the equations derived from this investigation are demonstrated by a description of their use as an aid in the study of planing and impact. Applications of the results of these studies, in general, are treated in the Discussion. Report no. 335. Contract N6onr-247, Project NR 062-012. E.T.T. project no. CC839.

Biassed random walks, part II, by Gilbert W. King. Little, Arthur D., Inc., Cambridge, Mass. Aug 1953. 37p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115194

The effect of steric hindrance on the configurations of polymer chains was investigated by varying the relative probability of the trans and cis rotational orientations. The distribution of end-to-end distance was shown to be gaussian. This biassing is used to increase the sampling of the heads and tails of dis-

tributions of unbiassed configurations because the relative weight factors may be precisely calculated. Excluded volume applied to the biassed chains apparently leaves them gaussian, at least for 64 steps. The preservation of the gaussian distribution encouraged a theoretical investigation. A method of obtaining the characteristic function of the end-to-end distribution, in the presence of biassing Markoff processes, was developed. This method was extended to the general problem of excluded volume. The distribution of end-to-end distance is shown to be still gaussian. C-57848. Contract N6-onr-228, T. O. II, Project NR 330-006, Technical report no. 7. For Part I see PB 112520.

Coalescence of droplets in a turbulent jet, by Arnold Kivnick. Illinois. Engineering Experiment Station, Urbana, Ill. Aug 1952. 29p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115240

Two derivations have been made, one which permits the estimation of the probable upper limit of coalescence, and a second which takes into account the effects of dilution of the spray in the jet which reduces the coalescence. The first consideration results in a relationship which may be evaluated easily; the second gives rise to a partial differential equation which is not susceptible to analytical solution. A solution by iteration of the corresponding finite difference equation is discussed in the Appendix. Contracts no. DA-18-064-CML-445 and no. N6ori-71, T. C. XI. Technical report no. CML-4. Appendix: Report on preliminary investigation of solution of Illinois jet coalescence equation, by Arthur Rose and Joan A. Schilk, Pennsylvania State College.

Durability and bearing capacity of an ice layer, by Bengt O. E. Persson. Translated by William Dias. Apr 1954. 20p diagrs, graphs, map Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115409

Translated from Svenska vagfovening, vol. 35, Dec 1948. Investigation of construction and maintenance of airdromes on ice, 1953-1954.
1. Ice - Elasticity - Sweden 2. Ice - Strength - Sweden 3. U. S. Army. Corps of Engineers. New England Division. Arctic Construction and Frost Effects Laboratory, Boston, Mass.

Effect of tube vibrations on flow through tubes, by Edward Silberman. Minnesota. University. St. Anthony Falls Hydraulic Laboratory. Nov 1951. 45p photos, diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115267

This paper presents an approximate analysis and an experimental investigation of the effect of external vibration on flow in tubes. Only flow in straight tubes of uniform cross section was considered. Project report no. 27. Contract N8onr-66205.

Elliptic integral solutions of axially symmetric free surface flow problems, by Howard M. Berger. U. S. Naval Ordnance Test Station, Inyokern, Calif. Nov 1950. 41p diagrs, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 114469

A simple model is introduced to facilitate studying the problem of determining steady state, constant pressure cavity shapes in a perfect fluid. A solution for all cavitation numbers giving the axial distance as a function of the radius is found in the form of elliptic integrals. Calculations are carried out for a flat plate and several right circular cones at various cavitation numbers. Local project 329. NOTS TM 808-54.

Experimental study of axial flow pump cavitation, by P. Guignard, T. Fuller, A. J. Acosta. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. Aug 1953. 20p photos, diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115327

A qualitative study of the effects of cavitation on the performance of an axial flow pump was made. Photographic evidence shows that cavitation need not occur first on the blade surface but could occur in the free stream. This phenomenon is ascribed to a flow through the tip clearance space. Cavitation similarity was found to be determined by the cavitation number K, Thoma's σ, or the suction specific speed S for the conditions of these tests. Report no. E-19.3. Contract N6onr-244, Task order II, NR 062-010.

Frictional resistance in rough pipes. Final report under Contract N7onr-32910, Project no. NR 062-079, by Ernest A. Brunauer. Illinois Institute of Technology. Dept. of Mechanics, Chicago, Ill. Jul 1952. 53p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115320

The main tests of this investigation consisted of the measurement of velocity distribution and frictional resistance.

Laminar flow through granular media, by S. Tsakonas and R. Skalak. Columbia University. Dept. of Civil Engineering. 1953. 47p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115321

This report deals with the motion of fluids thru media of consisting of particles or grains, attention being restricted to laminar flows. The primary concern of this report is to give a unified discussion of various theories of flow thru granular media and to evaluate particularly the variation of the permeability with the porosity of the media. Contract

Nonr-266(10), Technical report no. 2. Project NR-062-140/5-22-51. CU-2-53-ONR-266(10)-CE.

Note on the flow of vapor between liquid surfaces, by Milton S. Plesset. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. Dec 1951. 11p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115270

The mass flow of vapor from a liquid surface at temperature T_0 to another surface of the same liquid at temperature $T_1 (T_1 < T_0)$ may be very readily determined in the case of one-dimensional flow from the conservation relations for mass and momentum. The temperature of the vapor between the liquid surfaces may also be found when viscous effects in the vapor flow are neglected. Contract N6onr-24426, NR 062-083. Report no. 26-5.

On the force between oscillating spheres. Interim report under Contract number N6-ori-100, Task order I, by R. Clark Jones. Ultrasonic Corporation, Cambridge, Mass. Dec 1947. 29p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115279

1. Spheres, Oscillating - Hydrodynamics 2. Spheres, Oscillating - Theory 3. Spheres, Oscillating - Pressure 4. Bernoulli force (Oscillating spheres) 5. Dynamics, Fluid - Theory 6. Stokes' equation.

One-dimensional fluid flow produced by confined sparks, by William R. Atkinson. Oklahoma. University. Research Institute. 1953? 68p drawing, diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 115506

Project 87. Contract no. Nonr 982(02), Project NR 061-078. Summary of thesis.
1. Flow, One dimensional 2. Discharges, Electric - Light - Measurement 3. Gas flow - Compression shocks.

Pulse integrator for measuring intensity of turbulence by salt diffusion method, by Walter J. Charow. Worcester Polytechnic Institute. Alden Hydraulic Laboratory, Worcester, Mass. Apr 1952. 13p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115319

This investigation was a preliminary survey to determine suitable instruments for the measurement of turbulence by the diffusion of an electrolyte. Contract N9onr-89200, Final report. Thesis - Worcester Polytechnic Institute, submitted Oct 10, 1950.

Theoretical analysis of the flow in a three dimensional compressor, by F. G. Gravalos. Rensselaer Polytechnic Institute, Troy, N. Y. Aug 1947. 36p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115328

ONR Contract no. 7, Task I, Report no. 1.
1. Equations of motion 2. Flow, Three dimensional - Theory 3. Compressors, Axial - Blades - Flow - Calculation 4. Flow, Cylindrical - Distortion 5. Bernouilli's equation.

Transfer of momentum in jet of air issuing into a tube, by L. G. Alexander, E. W. Comings, H. L. Grimmett, E. A. White. Illinois. Engineering Experiment Station, Urbana, Ill. May 1952. 54p photo, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115237

Contract N6-ori-71, Task order no. XI.
1. Flow, Jet mixing - Momentum transfer 2. Flow, Jet mixing - Theory 3. Reichardt's theory (Jet flow) 4. ILU EES TR 11.

Transition probabilities of molecular band systems. XIII: Collected results of N_2, NO, O_2, O_2^+, OH, CO, CO^+, by W. R. Jarmain, P. A. Fraser, and R. W. Nicholls. University of Western Ontario. Dept. of Physics. Aug 1954. 16p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115504

Scientific report no. 18. Contract no. AF 19(122)-470
1. Spectroscopy, Molecular - Mathematical analysis - Canada 2. Molecules - Vibration - Canada.

Turbulent mixing in an isothermal free jet, by J. F. Taylor, H. L. Grimmett, E. W. Comings. Illinois. Engineering Experiment Station, Urbana, Illinois. Nov 1948. 45p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115236

A 1/2 inch diameter free air jet mixing isothermally with the surrounding air is described. Complete radial profiles of velocity were measured at a number of positions along the axis of the jet by means of a 0.065 inch o.d. impact tube. Initial jet velocities up to 300 ft./sec. were used. These profiles were used to calculate the mass, momentum, and kinetic energy passing the plane of the profile. The data have been correlated by empirical equations. Technical report no. 2. Contract N6-ori-71, Task order no. XI. ILU EES TR 2.

Vaporization rates and drag coefficients for isooctane sprays in turbulent air streams, by Robert D. Ingebo. U. S. National Advisory Committee for Aeronautics. Oct 1954. 39p photos, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115513

Drop-size distribution and drop-velocity data were obtained for isooctane sprays in turbulent air streams using a droplet camera developed at the NACA Lewis laboratory. Experimental spray vaporization rates, based on the mean diameter, correlated single-droplet vaporization rates. An empirical expression was derived for isooctane droplet drag coefficients. NACA TN 3265.

Nuclear

Constant air monitor for alpha-emitting isotopes, by John A. Auxier and Walter Blakey. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 8p drawing, diagrs, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115232

A dependable instrument has been constructed and tested for monitoring air for alpha contamination. An air-filled proportional counter, pulse amplifier, alarm unit, and power supplies were assembled in such a manner as to operate satisfactorily. AAF SAM Proj 21-3501-0003, Report no. 7.

Energy determination of Cs^{137}K conversion electrons, by S. K. Bhattacherjee, B. Waldman and W. C. Miller. University of Notre Dame. Nuclear Physics Laboratory, Notre Dame, Ind. Dec 1953. 20p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115231

The electrostatic analyzer, previously used to determine the photo-thresholds of deuterium and beryllium, has been used to measure the energy of the K-conversion electrons from Cs^{137}. A value of 625.2± 0.9 Kev was obtained, in good agreement with the measurements of others. Contract N6ori-83, T. O. II, NR 024-022.

Evaluation of approximation methods for three body scattering problems, by Solomon L. Schwebel. New York University. Institute of Mathematical Sciences. Div. of Electromagnetic Research. May 1954. 128p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115209

The Born approximation and the Schwinger variational principle are applied to two one-dimensional three-body scattering problems. These problems are also solved exactly, and their solutions exhibit the physically interesting processes of elastic, inelastic, and exchange scattering. Comparison between the exact cross sections for these various processes with those obtained from the approximation methods serves to evaluate the range and validity of these methods. The results are then examined to determine which are of general applicability and which are peculiar to the specific problems studied. Contract no. AF 19(122)-463. NYU RR CX-15.

Experimental studies of transport phenomena in highly ionized gases, by Beryl Edward Clotfelter. Oklahoma. University. Research Institute. 1953? 69p photos, drawings, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 115507

Project 87. Contract no. Nonr 982(02), Project NR 061-078. Summary of thesis.
1. Gases, Ionized - Conductivity - Theory 2. Hall effect 3. Particles, Charged - Distribition 4. Ions - Velocity - Measurement 5. Ions - Velocity - Measuring equipment.

Standard source of radiation for radiac detectors, by H. M. Childers, A. E. Nash, and J. D. Graves. U. S. Naval Research Laboratory. Aug 1954. 17p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115452

Two radiation field ranges of similar design have been constructed and calibrated for use with Co^{60} and Cs^{137} sources to produce standard gamma fields. Included in the report are results of a study of the uniformity of the field intensities and the effect of shielding in the vicinity of the field points. NRL R 4394.

RUBBER AND RUBBER PRODUCTS

Ammunition can gaskets, by R. F. Shaw. U. S. Arsenal, Rock Island, Ill. Apr 1949. 10p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115300

Figure and table mentioned in text are omitted. Project no. TB4-521C; General development of rubber for ordnance applications.
1. Gaskets - Materials - Tests 2. Gaskets, Synthetic rubber - Tests 3. Ammunition - Boxes - Gaskets 4. RIAL R 49-386.

Low-speed yawed-rolling and some other elastic characteristics of two 56-inch-diameter, 24-ply-rating aircraft tires, by Walter B. Horne, Bertrand H. Stephenson and Robert F. Smiley. U. S. National Advisory Committee for Aeronautics. Aug 1954. 108p photos, drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115140

The low-speed (up to 4 miles per hour) cornering characteristics of two 56 x 16, type VII, extra-high-pressure, 24-ply-rating tires were determined for a range of vertical loadings, yaw angles, and tire inflation pressures. Locked-wheel drag tests were also made for one vertical load condition. The quantities measured included cornering force, drag force, self-alining torque, pneumatic caster, ver-

tical tire deflection, rolling radius, and relaxation length. Some supplementary tests were made which included measurements of tire footprint area, vertical-load-deflection characteristics, and the variation of tire radius and width with inflation pressure. NACA TN 3235.

STRUCTURAL ENGINEERING

Dynamic modeling for stress similitude, by R. M. Hermes. Santa Clara. University. Dept. of Applied Mechanics, Santa Clara, Calif. Jun 1949. 37p diagr, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115239

A method of rendering the equations of motion of a vibrating beam in dimensionless form is presented. The parameters, which must be kept constant for modeling for dynamic stress similitude, are derived from the foregoing dimensionless equations of motion. Internal damping is considered and the conclusion is reached that it can be satisfactorily modeled. The effect of internal damping in causing an increase of stress is recognized and evaluated. The modeling of a cantilever beam whose root is subjected to an impulse is treated. For convenience the eigen-functions in dimensionless form are summarized for each of the six types of vibrating beams, together with the frequency equation and its first five roots and the first five dimensionless natural frequencies. The speed of sound for various common metals is also listed. Contract N8onr-523, T. O. I. Technical report no. 1.

Effectiveness of flooring nails versus toothed fastener, by E. George Stern. Virginia Polytechnic Institute. Wood Research Laboratory, Blacksburg, Va. Sep 1954. 8p photo, graphs, table Available from Virginia Polytechnic Institute, Blacksburg, Va. PB 115480

Sponsored by Independent Nail and Packing Co., Bridgewater, Mass.
1. Nails, Flooring - Tests 2. Independent Nail and Packing Co., Bridgewater, Mass. 3. VPI WRL 16.

TEXTILES AND TEXTILE PRODUCTS

Carbonizing investigations. I: A review of the literature, by D. H. Simmonds. Australia. Commonwealth Scientific and Industrial Research Organization. Wool Textile Research Laboratories. 1954. 12p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115333

Wool Textile Research Laboratories Technical Paper no. 2.
1. Wool - Carbonization - Australia 2. Wool - Processing - Australia 3. Carbonization agents - Australia 4. AUS CSIR WTRL TP 2.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

An evaluation of an accelerometer method for obtaining landing-gear drag loads, by Jerome G. Theisen and Philip M. Edge, Jr. U. S. National Advisory Committee for Aeronautics. Oct 1954. 22p photos, graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St. N. W., Washington 25, D. C. PB 115486

1. Loads, Landing - Impact 2. Loads, Landing - Impact - Photographic interpretation 3. Landing gear - Wheels - Drag loads - Measuring equipment 4. Accelerometers - Uses 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA TN 3247.

Experimental investigation of the effect of wheel prerotation on landing-gear drag loads, by Dexter M. Potter. U. S. National Advisory Committee for Aeronautics. Oct 1954. 19p photos, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115488

1. Loads, Landing - Impact 2. Landing gear - Drag 3. Landing gear - Impact loads 4. Landing gear - Wheels - Drag 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA TN 3250.

Experimentelle untersuchungen über das spornradflattern. (Experiments on tail-wheel shimmy), by O. Dietz and R. Harling. Translated by Mary L. Mahler. Oct 1954. 81p photos, graphs, drawings Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 73630t

Translated from Zentrale für Wissenschaftliches Berichtswesen über Luftfahrtforschung des Generalluftzeugmeisters (ZWB), Forschungsbericht nr. 1320, Nov 25, 1940. (In PB 73630).
1. ZWB FB 1320, Translation 2. NACA TM 1376.

Hydrodynamic characteristics of an aspect-ratio-0.125 modified rectangular flat plate operating near a free water surface, by John A. Ramsen and Victor L. Vaughan, Jr. U. S. National Advisory Committee for Aeronautics. Oct 1954. 32p diagrs, graph Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115511

1. Wings, Rectangular - Aspect ratio 2. Plates, Rectangular - Hydrodynamics 3. Plates, Rectangular - Aspect ratio 4. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 5. NACA TN 3249.

SELECTED LIST OF ATOMIC ENERGY REPORTS OF INTEREST TO INDUSTRY

The following Atomic Energy reports are listed here because of their interest and usefulness to general industry.

Reports may be purchased in accordance with instructions on the inside front cover of the U. S. GOVERNMENT RESEARCH REPORTS. As PB numbers are not indicated, order by series and number. These reports may also be consulated at any AEC Depository Library. A list of these libraries may be obtained from the U. S. Department of Commerce, Office of Technical Services, Washington 25, D. C.

Reproduction in whole or part of any report listed herein is encouraged by the U. S. Atomic Energy Commission, subject to the approval of authors or originating sites. General inquiries from the industrial press about AEC-developed information should be directed to the Industrial Information Branch, Atomic Energy Commission, Washington 25, D. C.

Chemistry and Chemical Engineering

Progress report on fission products utilization. VI. Further Studies of the Effect of Gamma Radiation on Vinyl Polymer Systems, by D. S. Ballantine. Brookhaven National Laboratory. March 1954. 18p. $.25. (BNL-294 (T-50))

Infrared spectrum of UF_6 at elevated temperatures, by N. J. Hawkins, H. C. Mattraw, and D. R. Carpenter. Knolls Atomic Powder Laboratory. February 1, 1954. Contract No. W-31-109-eng-52. 7p. $.20. (KAPL-1041)

Corrosion of reactor structural materials in high-temperature water. I. Descaling methods, by R. Fowler, Jr., D. L. Douglas, and F. C. Zyzes. Knolls Atomic Power Laboratory. August 27, 1954. Contract No. W-31-109 Eng-52. 30p. Microfilm $2.25, Photocopy $4.00. (KAPL-1198)

The lithium-sodium liquid metal system, by O. N. Salmon and D. H. Ahmann. Knolls Atomic Power Laboratory. August 20, 1954. Contract No. W-31-109 Eng-52. 25p. Microfilm $2.25, Photocopy $4.00. (KAPL-1205)

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